Department for Education

Identifying Variation in Learner Outcomes by Further Education Provider

Research Report

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Executive Summary

This report presents results of a project to investigate how the labour market outcomes secured by individual learners vary across Further Education (FE) Providers. The research is the latest in a series of studies previously commissioned by BIS (now BEIS) of ILR-WPLS[1] administrative data that estimate the value added of Further Education, as reflected in the Earnings, Employment and Benefit premiums secured by FE learners. This programme of investigation identifies good labour market returns to FE learning, and compelling evidence that previous less favourable findings (relating to vocationally-oriented learning at Level 2 and below) were a result of data limitations, rather than insignificant value added.

Aims and methods

The analysis undertaken looks at comparisons of value added across Providers, and from this one can identify Providers who, according to the analysis, are performing above or below the level one would expect (given their student intake, location and other factors).

The analysis is exploratory in nature and the key aims are to:

(i) identify the extent to which we observe variation in average labour market outcomes across FE Providers;
(ii) explore the potential of the data to provide robust indicators that might explain variation in Provider performance; and
(iii) what we might consider as next steps in the research.

The majority of the report describes results from an econometric analysis that estimates value added, based on comparisons of achievers and non-achievers/drop-outs 'within' each Provider. This follows the approach used in previous BIS-commissioned studies. The assumption is that labour market outcomes from the non-achieving/drop-out group within each Provider, provide us with estimates of the counterfactual for 'the sort of achievers we observe within a specific Provider'.

The 'within' approach to analysis of Provider value added calculates a measure for each FE Provider by:

1. Estimating a separate [Achiever V Non-achiever/drop-out] regression for all individuals with the relevant highest learning aim within a particular Provider.

[1] Individualised Learner Record - Work and Pensions Longitudinal Study

These regressions include individuals who started a relevant learning spell from 2004/2005 onwards, and who completed (achieved or not achieved) by 5th April 2011 (as we have earnings data up to the 2012/13 financial year).

2. Each one of these regression equations provides us with an average estimate of Provider value added, in terms of (i) earnings, (ii) employment and (iii) HE premiums, measured two years from the end of learning[2].
3. We then present the variation in these value added measures, across all Providers that meet a minimum size requirement.

Additionally, separate supplementary econometric analysis is carried out, which compares the outcomes of achievers across (or 'between') FE Providers that have a similar intake. If the value added for Provider 1 using an Achiever V Non-achiever approach, is larger than that for Provider 2 (and, importantly, both Providers have similar intakes), then a comparison of the returns to Achievers in Provider 1, with the returns to Achievers in Provider 2, should confirm this difference.

In both sets of analysis, any difference between and within Providers that we cannot explain is necessarily estimated with error – something that must be taken into account in all statistical studies. If we observe a difference in the value added between Provider 1 and Provider 2 from the achiever V non-achiever analysis, it is not necessarily the case that all the difference is due to a gap in value added. As a result, all the findings here should be considered with caution.

Key findings

Providers and Labour Market Outcomes

There is evidence of extensive Provider level variation in labour market returns that cannot be easily explained. Specifically,

Providers with ≥1,500 students with highest learning aims in the relevant qualification category, two years after end of learning

- 69.9% of the 239 Providers have positive average earnings premiums where the highest learning aim was Thin Level 2 and below
- 83.9% of the 316 Providers have positive average earnings premiums where the highest learning aim was Full Level 2, Level 3 or Full Level 3

[2] Using two years is a compromise, trading off currency of findings, with the extent to which we observe any returns being sustained; and at the same time attempting to keep the numbers underpinning each regression high enough to secure robust estimated returns.

- Number of sites of the Provider is positively associated with higher employment and earnings returns for learners where highest learning aim was Thin Level 2 and below
- Higher proportion of learners studying full time is associated with higher employment returns for learners where the highest learning aim was Thin Level 2 and below
- The proportion of learners aged 25+ is negatively associated with earnings returns for learners where the highest learning aim was Thin Level 2 and below, and employment returns where the highest learning aim was Full Level 2 and above

Larger providers with ≥5,000 students with highest learning aims in the relevant qualification category, two years after end of learning

- Higher proportion of learners who are White is associated with higher employment returns for learners where the highest learning aim was Thin Level 2 and below
- Higher proportions of Full Level 3 provision within the Provider is associated with higher progression to HE.

Balance of provision, regional differences

Within each category of highest learning aim, some sector subjects have higher returns and some lower returns. These two indicators capture the proportion of a Provider's delivery focused in 'high return' sectors and the proportion that is located in the 'low return' sectors (referred to as the '*Balance of Provision*').

Balance of provision is sometimes a more important explanation for Larger Providers and results in some findings that perhaps confound expectations:

- Providers that have a balance of provision towards low-employment-return sector subjects, have higher average employment value added, when considering Level 2 and below (i.e. exhibiting a positive correlation that we might not expect).
- Providers that have a balance of provision towards higher-earnings-return sector subjects, have higher average earnings value added, when considering Full Level 2+ (i.e. positive correlation)
- Providers that have a balance of provision towards higher-employment-return sector subjects, have higher average employment value added, when considering Full Level 2+ (i.e. positive correlation)
- Providers with a high proportion of their delivery focused on Thin Level 2 highest learning aims, have significantly lower returns, when considering value added; as reflected in Thin Level 2 and below employment outcomes.
- Providers with a greater balance of delivery towards highest learning aims of Full Level 2 are associated with higher Full Level 2+ earnings returns (though this is only statistically significant at the 10% level); but a balance of delivery towards L3 highest learning aims, is associated with lower Full Level 2+ earnings returns.

There is some evidence that Providers in Yorkshire and The Humber have higher HE progression premiums than Providers in the North of England.

Characteristics of highest, middle and lowest ranked Providers

The ranking of large Providers is based on the estimated gap between their expected and actual value added, with analysis concentrating on Thin Level 2 and below, and Full Level 2+.

Generally, there remains some negative correlation between Provider performance and the proportion aged 25+; there is a tendency for the proportion located in the South and London to be greater amongst both the highest and lowest ranked, compared to the middle-ranked. When considering Level 2 and Below Level 2 learning, the higher-ranked Providers have a higher average Index of Multiple Deprivation score (28.6), when compared to both the middle (24.9), and lower (24.2) ranked Providers. In contrast when considering the Full Level 2+ categories of learning, the average IMD score remains higher in the lowest-ranked Providers, but with the highest ranking Providers still having a higher average IMD score than the middle-ranked.

This reflects some tendency for the highest and lowest-ranked Providers to be located in more disadvantaged areas. More work is needed in this area, but it seems consistent with findings from other work[3] that identifies higher returns to many FE qualifications for learners from disadvantaged backgrounds (suggesting that, if a Provider gets it right in these areas, returns can be high); but also, findings that learners from disadvantaged backgrounds tend to be less-well-informed about educational choices (and therefore poorer-performing Providers in these areas have a potentially less discerning client group). Our analysis hints at the potential for greater Provider variability in the poorest areas of England, but more work is needed.

Correlation between OFSTED scores and value-added at Provider level

Overall, there is little apparent correlation between OFSTED scores and value-added at the Provider level (earnings value added, employment or HE progression).

What are we to take from this analysis?

Whilst there are a number of strengths and weaknesses to the econometric approach adopted in this report, one must be very careful in the interpretation of results relating to

[3] Bibby, D., Cerqua, A., Gould, M., Thomson, D. and Urwin, P. (2015), “Further Education: Skills, Second Chances and Pathways to Social Mobility”, mimeo.

specific Providers. However, with this caveat in mind, whether we consider raw differences in labour market outcomes; [two sets of] value added estimates prior to consideration of Provider-level characteristics; an analysis that also takes account of Provider-level characteristics; or splits of the population that differentiate larger and smaller Providers, there is evidence of extensive Provider-level variation in labour market returns, which cannot easily be explained.

A key issue for future development, is the inclusion of more Provider-level characteristics (particularly those related to teacher quality, resource, funding, class size etc.). In some of our Provider-level regression equations there are very few significant variables. This could reflect the fact that generally Provider-level indicators are not important in explaining differences in value added; but it is more likely the case that we are simply not capturing some of the key factors that explain differences in performance. It is quite possible that Providers that rank lower using both approaches to analysis, are doing so in both instances because of the factors we are not able to include in our Provider-level analysis.

This analysis is very exploratory in nature, and more work is needed before we have analyses that can be considered as robust. It may be useful for the Department for Education to follow-up with a specific qualitative/case study investigation of some of the larger Providers at the extremes of our value added ratings.

We would not wish the current analysis to be used to identify specific under-, or over-performing Providers. However, when considering raw differences in labour market outcomes, we see significant variation across Providers. Having estimated labour market value-added, and controlling for additional Provider level characteristics, there remains considerable unexplained variation in returns. This warrants further investigation.

1. Introduction

This report is the latest in a series of studies previously commissioned by BIS (now BEIS), using ILR-WPLS administrative data to estimate the value added of FE, as reflected in the Earnings, Employment and Benefit premiums secured by FE learners (see for instance, Thomson et. al., 2010; Patrignani and Conlon, 2011; Buscha and Urwin, 2013; Bibby et. al. 2014; Bibby et. al. 2015; 2015a; 2015b; Cerqua and Urwin, 2016). This programme of investigation identifies good labour market returns to FE learning, and compelling evidence that previous less favourable findings (for instance, relating to Level 2 vocational learning) were a result of data limitations, rather than truly insignificant value added. In addition, analysis of ILR-WPLS data identifies good labour market returns for many individuals undertaking FE learning at Entry level and Level 1 (for instance in Maths and/or English), where previously there was no evidence on outcomes (see Cerqua and Urwin, 2016).

For example, we find an 11% earnings return for 'Full Level 2[4]' learning, and underpinning this figure there is some variation (or heterogeneity) - for instance men secure a 13% return, whilst for women the figure is 9%. For each headline return estimate, for a particular highest learning aim, studies of ILR-WPLS data have investigated how these returns vary according to 'Individual' characteristics (for instance gender) and according to the characteristics of the 'qualification' being taken (for instance, within this wider 'Full Level 2' category, we have considered how the 11% earnings return varies across different subject sector areas).

The report here, presents the results of a project to investigate how the labour market outcomes secured by individual learners vary across FE Providers. The analysis is based on ILR-WPLS matched administrative data, and uses an achiever V non-achiever/drop-out approach to estimation, similar to that used in the BIS-commissioned studies mentioned above[5]. The majority of the report presents results of an analysis that begins by calculating a measure of value added for each Provider by,

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[4] In the *Full Level 2* category we include all highest aims that are equivalent to 5 GCSEs at grade A* to C (including apprenticeship qualifications): in the *Full Level 3* category we include all highest aims that are equivalent to two A levels (including apprenticeship qualifications); and *Level 2* and *Level 3* includes learners with highest aims at these levels of study, but which fall below the equivalence required to be considered 'Full'.

[5] In existing studies of ILR-WPLS data, we have overcome the potential problems of negative selection [on unobservables] into lower-level FE learning, by using a control group that also select into FE; we compare the returns of those who achieve a certain FE learning aim, with those who have the same highest FE learning aim, but who do not achieve/drop-out. Across a number of ILR-WPLS studies we have collated the necessary evidence needed to counter the potential weaknesses of this approach - that unobservable characteristics or events possibly drive selection into achievement.

1. Estimating a separate [Achiever V Non-achiever/drop-out] regression for all individuals with the relevant highest learning aim within a particular Provider. We include individuals starting relevant learning spells from 2004/2005 onwards, and who complete (achieve or not achieve) by 5th April 2011 (as we have earnings data up to the 2012/13 financial year).
2. Each one of these regression equations provides us with an average estimated (i) earnings, (ii) employment and (iii) HE premium, for the relevant Provider, measured two years from the end of learning[6]. The estimate for earnings excludes individuals attending HE within the 2 years following the end of their highest latest learning spell; and in parts of the analysis we also present a 'composite' indicator that reflects the proportion of individuals in employment and/or HE, two years from the end of FE learning.
3. We then present the variation in these value added measures, across all Providers that meet a minimum size requirement (in terms of student numbers observed in the ILR).

The achiever V non-achiever approach to estimation is potentially well suited to the comparison of value added across FE Providers, as it allows us to ask, 'what is the value added for the sort of students who enter Provider X, compared to the value added for the sort of students who enrol in Provider Y?'. By securing an estimate of premiums in this way, we can be more confident of capturing the value added by each Provider, as counterfactual estimates are created from a control group of students who enrol at the same Provider. If the Provider generally has a more challenging group of students (perhaps in ways we cannot observe), then we would expect this to be reflected amongst both their achievers and non-achievers/drop-outs – non-achievers for the particular Provider arguably provide a more realistic estimate of the outcomes we would expect of students achieving in that institution, if they had not obtained the qualification (i.e. the counterfactual). In each case, we are potentially capturing a better estimate of the 'journey travelled' by the learners of each institution, even when they have very different starting points for such a journey.

This is only the first step in our analysis, as it does not take into account the potential for Provider-level characteristics to be responsible for some of the variation in outcomes (value added) between Providers. For instance, Providers in very poor areas may face a greater challenge to deliver good outcomes, because they have a particularly large volume of challenging learners (this may also manifest as negative peer effects, as

[6] Using two years is a compromise, trading off currency of findings, with the extent to which we observe any returns being sustained; and at the same time attempting to keep the numbers underpinning each regression high enough to secure robust estimated returns.

discipline may be more of a problem). Similarly, Provider X may have a balance of provision that is focused towards sector subject areas that provide lower labour market returns (see for instance, Bibby et. al. 2014); and we would want to take some account of this when comparing the average returns in Provider X to those of Provider Y, where the latter has a balance of delivery in high-earning sectors.

Therefore, having set out the variation in value added between Providers (estimated using steps 1 to 3 above), we carry out an analysis that accommodates these 'Provider-level' characteristics (following a process of matching the ILR-WPLS to the Provider Reference Dataset). Much of our discussion focuses on the question of how much the differences in value added between Providers can be explained by factors such as Regional characteristics (including local unemployment rates and IMD scores[7]); the Balance of Provision, Age Distribution etc. This allows us to ask what, if anything, is driving differences in value added across Providers?

Controlling for more and more Provider-level characteristics, we would expect the distribution of value added across Providers to 'narrow' and ultimately, all the variation may be explained, so that there are no remaining differences between Providers. In contrast, if there is still significant variation in the value added of Providers after controlling for all observable differences, then we may imply that any remaining difference reflects variation in the efficacy of Providers. However, as underlined at various points in the following analysis, this is very much a first attempt to map variation in Provider value added and it is important to recognise both strengths and limitations of the approach.

Specifically, when carrying out an analysis that estimates the [statistically significant] factors associated with variation in value added across Providers, any difference between Providers that we cannot explain is necessarily estimated with a margin for error – something that must be taken into account in all statistical studies. This is perhaps best explained using the analogy of work that considers the gender pay gap. For instance, when estimating a regression equation that predicts the wage of individuals, it is usually the case that whether somebody works part-time or full-time has a large impact; and inclusion of this factor will explain some of the difference in wages between men and women. In the same way, we may find that, for instance, sector-subject-mix explains some of the differences in value added between Providers.

[7] The Index of Multiple Deprivation (IMD) is a geographic indicator based on postcode that reflects the levels of deprivation in the locality, variously measured. IMD summarizes seven distinct domains; Income Deprivation, Employment Deprivation, Health Deprivation and Disability, Education Skills and Training Deprivation, Barriers to Housing and Services, Living Environment Deprivation, and Crime. A higher score is associated with areas that experience higher levels of deprivation.

In the literature on gender pay gaps, the difference (or gap) in the pay of men and women that remains unexplained [having accounted for as many observable characteristics as possible], is often taken as an indicator of discrimination – even though it will also contain some of the variation that remains unexplained because of other factors (in addition to discrimination) that we do not observe in the data (captured in our 'error' term). This is analogous to our example, where any variation in Provider value added that remains unexplained, will include some amount of error that results from our inability to observe all factors associated with this variation. This analogy underlines the strength of our approach (as estimation of the gender pay gap is one that has a long history), but also the caution we must adopt when considering any residual variation in value added across Providers.

The majority of the report presents results from the econometric analysis described above, where estimated value added is based on comparisons of achievers and non-achievers/drop-outs 'within' each Provider. We also carry out a separate supplementary econometric analysis, which compares the outcomes of achievers across (or 'between') FE Providers that have a similar intake. If the value added for Provider 1 using an Achiever V Non-achiever approach (set out above), is larger than that for Provider 2 (and, importantly, both Providers have similar intakes); then a comparison of the returns to Achievers in Provider 1, with the returns to Achievers in Provider 2, should confirm this difference.

Section 2 begins by describing in more detail the data and methods used. Section 3 sets out the distribution of value added across Providers (in terms of earnings, employment and HE outcomes), using an achiever V non-achiever approach; prior to any consideration of Provider-level characteristics. In each case, we then describe the Provider-level characteristics (if any) that are most significant in explaining such variation (obtained from a Provider-level regression analysis of these value added estimates).

The analysis in Section 3.1 is undertaken for all Providers that have more than 1,500 individuals with highest learning aims in the relevant qualification category. Section 3.2 then focuses analysis on larger Providers that have more than 5,000 learners in the relevant highest aims category. The analysis is split in this way because Section 3.1 can provide some indication of the Provider-level characteristics that are most important in explaining difference in value added, across a broad population of FE Providers – allowing us to be more confident that findings may be 'representative' of the sector. This also assures a larger number of observations in the Provider-level regression analysis, allowing us to test the impact of a broader range of Provider-level characteristics. However, a figure of 1,500 is very much a lower-bound for estimation of the initial value-added measures utilised in these regression equations. One would not feel confident taking this analysis forward to identify Providers that are ranked significantly above or below the average, in terms of value added (hence Section 3.1 does not present the 'revised' Provider value-added distributions).

The focus of Section 3.2 on a smaller number of the largest FE Providers, produces value added estimates for each Provider, that are based on a much higher number of learners (5,000+). The counter to this, is that when estimating the [second stage] Provider-level regression equations, there are fewer observations (Providers). However, the greater confidence in specific estimates of value added means that Section 3.2 presents the distributions of value added both before and after accommodating Provider-level characteristics, to give some idea of what remains unexplained. All of the estimates presented are obtained from a regression analysis comparing achievers with non-achievers.

Section 4 considers findings from the analyses described in Section 3.2, and asks to what extent Providers who are identified as having a higher-than-average value added are different to those lower down the rankings. If Providers that are identified as performing much better than the average, have very different observable characteristics to those that perform much worse, this may suggest that the analysis has missed something.

For instance, when considering Provider X who seems to be achieving significantly worse value added for students and Provider Y who seems to be achieving exceptionally better outcomes (having controlled for a range of observables, in both the 'between' and 'within' analyses) it is important to ask, whether these comparisons seem fair - or has the analysis possibly missed something? If we find that these two institutions are in very similar locations, with very similar observable characteristics and similar student intakes, this more reasonably suggests that such comparisons are valid (on observable characteristics). In Section 4 we also consider whether OFSTED score has any explanatory power, as it may pick up some of the [currently] unobservable factors that potentially explain variation across Providers.

The analysis is exploratory in nature and a key aim is to identify (i) the extent to which we observe variation in average labour market outcomes across FE Providers; (ii) the extent to which this analysis delivers robust indicators that could be used to investigate 'quality' or 'efficacy' across FE Providers; and (iii) what we might consider as next steps in the research. As a result, all the findings here should be considered with caution.

If a Provider is ranked lower in both sets of analysis (both the 'within' and 'between' estimations) we may at first see this as some form of 'triangulation' of the findings. However for both sets of estimates, a key issue for future development, is the inclusion of more Provider-level characteristics (particularly those related to teacher quality, resource, funding, class size etc.). In some of our Provider-level regression equations there are very few significant variables. This could reflect the fact that generally Provider-level indicators are not important in explaining differences in value added; but it is more likely the case that we are simply not capturing some of the key factors that explain differences in performance. It is quite possible that Providers that rank lower using both approaches to analysis, are doing so in both instances because of the factors we are not able to include in our Provider-level analysis, and this should be kept in mind.

2. Data and Method

This study is based on the same underlying dataset and methodological approach used in Bibby et. al. (2014), with additional variables matched in from the Provider Reference Dataset, the inclusion of information from OFSTED inspections and a variety of regional indicators to identify the determinants of variation in value-added across FE Providers. Therefore, Section 2.1 sets out a brief reminder of the underlying approach to data creation, pointing readers to Bibby et. al. (2014), and an accompanying Technical Annex, for more detail; and Section 2.2 describes additional issues that need to be considered, with respect to the specific econometric approach adopted here.

2.1 The ILR-WPLS Dataset

The ILR-WPLS dataset links FE learner information, benefit and PAYE employment histories for tens of millions of individuals. The first step in compiling the data for analysis is the creation of a unique identifier linking an individual's records across the constituent databases and data files. Each constituent data source has its own unique individual identifier which may not be internally unique, and which (before transfer to the project team) may incorrectly ascribe records to the same individual; and conversely not match records correctly to the same individual. We use the 3 identifiers from the ILR, National Benefits Database (CCORCID) and the HMRC person-instance-ID (PID) to construct an over-arching Person-key to link records in the data sources reliably to the same individual.

The identification of distinct ILR learners starts to take place where there is at least one other referencing identifier – here CCORCID and PID (noting that not all individuals have both of these records). We use the three identifiers in a process of 'record chaining' to show the relationships between them, accepting that we have insufficient information to indubitably decide which linkages are correct and which are not. As a consequence, we develop a set of procedures to arbitrate between competing matching possibilities according to circumstances, but without rejecting the possibility of the same individual having more than one CCORCID or PID. These procedures lead to the creation of our Person-Key, which identifies the same individual in the various data sources within our database.

This results in just over 25 million Person-Keys, which is reduced to almost 22 million once individuals found only in European Social Fund (ESF) and Adult and Community Learning (ACL) ILR files are removed for analysis. Of this latter total, some 0.5 million Person-Keys (2.5%) are associated with more than one PID (and a few with more than one CCORCID). A majority of Person-Keys do not have a CCORCID and although this will be associated with younger FE learners not having been in receipt of benefits when first matched (and never being matched subsequently), some of the absent matches will be related to under-matching as a result of the fields used in the matching routines.

These issues of under-matching, the implications for analysis and a variety of other issues of data imputation and merging are detailed at length in Thomson et. al. (2010); summarised in Buscha and Urwin (2013) and Bibby et. al. (2014); and also in an accompanying Technical Annex for the latter. Within the ILR, we identify 2,053 separate Providers and use UKPRN to match to information in the Provider Reference Dataset. There is some private provision recorded in the ILR, but it is hard to determine how complete the coverage is since private providers will only make returns if they receive public funding for some of their courses. For the purposes of recent ILR-WPLS BIS publications, we distinguish publicly funded, from privately funded learning; and focus our analysis on the former - as this is where the policy interest is. Therefore we will have included in our analysis (for instance in Bibby et. al. 2014), publicly-funded learning undertaken in private providers, and in the current study we will similarly include these private Providers (though our requirements for a minimum volume of learning within Providers will remove many more private, than public, Providers, as they are on average smaller).

Within this context, we can think of the current work as attempting to capture variation across FE Providers, in the labour market returns from publicly funded FE learning [which has formed the focus of ILR-WPLS reports to date]. The discussion in Sections 3.1, 3.2 and 4.1 provides more detail on the size and characteristics of Provider populations, as this varies for each separate category of highest learning aim and labour market outcome considered. Below is a brief explanation of the initial stages of selection of Providers from the overall ILR population.

Of the total 2,053 Providers in the ILR, Section 3.1 focuses only on those having at least 1,500 learners with the relevant highest learning aim for at least 1 of the 5 qualifications considered (Below Level 2, Thin Level 2, Full Level 2, Thin Level 3, and Full Level 3). This removes 1,381 Providers from our analysis, who between them have 969,062 highest learning aims – 9.80% of the total (with the 'total' referring to all 9.9m highest learning aims which end by 2013, and which have a valid UKPRN[8]). These 969 thousand excluded highest learning aims are mainly focused at Full Level 2 and Full Level 3. In the analysis we group qualifications into "Low Level Qualifications" (Below Level 2 and Thin Level 2) and "High Level Qualifications" (Full Level 2, Thin Level 3, and Full Level 3), and we are interested in Providers with a substantial number of individuals with earnings/employment/HE outcomes for each of these 2 groups. We also drop 312 Providers that started teaching one of our (five) specific qualification categories only after 2007 and/or having outcome values 2 years after the end of the learning spell for less than 1,500 learners for both groups of qualifications. This ensures that we have a large

[8] 11.73m learning aims (mainly occurring before 2006) are excluded, as they do not have a UKPRN

enough number of learners for analysis of the remaining 360 providers[9] and we retain 71.5% of our highest learning aim learner population (318 of these providers were recorded as active in 2013).

2.2 Econometric Analysis

As suggested in the introduction, the starting point for our analysis is the use of non-achievers to provide estimates of counterfactual outcomes for those achieving a certain qualification[10]. We estimate separately the (i) earnings, (ii) employment and (iii) Higher Education premiums secured by those who achieve a particular highest learning aim whilst studying at an English Further Education Provider (FEI), relative to those who have the same highest learning aim, but do not achieve, and who are also located within the same FE Provider.

For each learner we have 9 academic years (2004/2005 to 2012/2013) when they can possibly exit learning (as an achiever or non-achiever) and over these academic years, a learner can have multiple ILR learning spells. Across all of the learning spells for each individual we select the highest learning aim. Our subsequent estimates of value added (for instance, earnings) are obtained by comparing the returns of those who have a particular highest learning aim (for instance Full Level 2) and achieve; with the returns of those who have the same highest learning aim, but do not achieve – with both achievers and non-achievers/drop-outs located in the same Provider.

In comparing the returns of those who select into a qualification and achieve, with the returns of those who select into the same qualification and do not achieve, we have the potential to overcome some of the problems of selection experienced elsewhere in the literature. Many studies that utilise data from the Labour Force Survey identify negligible returns to some level 1 and level 2 vocational qualifications. However, this may be driven by the possibility that control groups in these studies contain many individuals who are not a realistic comparison group for those who select into level 1 and 2 vocational qualifications, particularly when this is their highest learning aim.

If individuals who would gain a lower wage (independent of their level of learning) are more likely to select into certain vocational qualifications, then estimated returns may be

[9] 196 of these providers meet the 1,500+ students criterion both for low level and high level qualifications, while we have enough students only for low level qualifications for 43 providers and only for high level qualifications for 121 providers.

[10] The estimate of what an individual would have earned in the absence of a qualification or training, is called the ‘counterfactual’, because it is counter to the factual state of the world (we can’t observe individuals taking the qualification, and not taking the qualification). To create credible estimates of counterfactual outcomes, we choose a comparison group that does not have the qualification, but provides a credible estimate of what the individuals with the qualification would have earned, if they had not taken the qualification.

falsely deflated if we compare them to a control group who do not select into this qualification (and we do not manage to control for the implied differences within a multivariate framework). This study may arguably provide a better comparison group because it overcomes some of the biases arising from these selection effects. However, there are weaknesses in comparing those who achieve, with those who fail to achieve or drop out, if we do not effectively control for ability and other potentially unobservable factors.

Bibby et. al. (2014) test the validity of this approach to the estimation of Value Added, and their work has been subjected to a rigorous process of peer-review by academic experts. The findings suggest that regression-based techniques, which compare achievers and non-achievers using ILR-WPLS data, produce robust estimates of value added. The more advanced techniques used to test this assertion, are Coarsened Exact Matching (CEM) and difference-in-differences methods (see Bibby et. al., Chapter 6 for more details). The results suggest that estimates obtained from the following standard regression approach (estimated using Ordinary Least Squares, OLS), provide robust estimates of value added; and these findings are further confirmed by work which focuses on the unemployed (Bibby et. al., 2015a; 2015b):

(a) $y_i = \alpha + Qual_i'\beta + \mathbf{x}_i'\gamma_x + \varepsilon_i$

where the dependant variable, , takes one of the following forms:

- Log of deflated daily earnings (top and bottom 1% removed) in the financial tax year, two years after the end of a learning spell.
- The probability of being employed (binary) exactly two years after the end of a learning spell[11].
- The probability of being observed in Higher Education, in any of the three years following the end of an FE learning spell.

The qualification variables are inserted as dummies where a value of 1 represents those who achieved their spell aim, whilst a value of 0 represents those who had the same spell aim, but failed to achieve any qualification within that spell. The coefficient then

[11] Some regressions have binary variables on the left-hand side. These models are also estimated using OLS resulting in a linear probability model (LPM). Such models have the disadvantage that out-of-bound predictions can occur (probabilities greater than 1 or less than 0) and also suffer from heteroskedasticity. However, the sheer size of these data make logit/probit modelling with marginal effects highly computationally intensive; particularly as our identification strategy requires each qualification level to be estimated in its own regression equation. LPM models generally performed well and we report robust standard errors.

represents an estimate of the return (or premium) to that qualification level, with equation (a) being estimated separately for each FE Provider in our data.

As the discussion develops, more comment is provided on our proposed identification strategy, not least because some of the findings seem to provide further support for its use. It is also worth noting that recent US articles in top-ranked academic journals have adopted a similar approach to estimation, with non-achievers/drop-outs within an individual Community College providing the basis for estimates of counterfactual outcomes[12]. However, even in the case where readers are not wholly convinced that this method is capturing a robust estimate of the absolute level of return within each Provider, it is possible that any bias in each one of our Provider equations may be in a similar direction, and this may be less concerning when considering relative comparisons. Furthermore, at the end of this section we describe a supplementary econometric analysis that uses a comparison of achievers across Providers to arrive at additional estimates of value added.

As suggested in the introduction, having estimated a version of equation (a) for each FE Provider, the subsequent (Earning, Employment and HE) value added estimates become our dependent variables in Provider-level regression equations that identify the significance of the following factors (Table 1) in explaining variation in value added across Providers. The results of these regression equations are presented in the Technical Appendix, estimating separately the returns for the FL2+ qualification category [containing those with highest learning aims of Full Level 2, Level 3 or Level 3+]; and the L2 and Below category [containing those with highest learning aims of Thin Level 2 or Below Level 2].

[12] See for instance, Jepsen, C., Troske, K. and Coomes, P. (2014), "The Labor-Market Returns to Community College Degrees, Diplomas, and Certificates", *Journal of Labor Economics*, 32 (1): pp. 95-121.

Table 1. Characteristics used in Provider-Level regression equations (Appendix)

Prop_25plus	Proportion of learners within the Provider who are aged 25+
Prop_white	Proportion of learners within the Provider who are white
Prop_FT	Proportion of learners within the Provider studying full-time
Log_ institution_size_until_2008	The size of the Provider as of 2008 (with the date chosen as a point prior to most of our return estimates occurring; but not too far in the past that it becomes irrelevant).
Average_IMD_score	The average Index of Multiple Deprivation for the Provider's intake of students.
Unempl_rate_la	Local area unemployment rate for the Provider's intake of students.
Gorname_num	Government Office Regions, with reference category *East of England*
Sites	Number of sites of the Provider. This is a proxy obtained using the number of learners with different delivery local authorities for each Provider.
Prop_BL2 ; Prop_L2 ; Prop_FL2; Prop_L3 ; Prop_FL3	These are the proportions of a Provider's delivery focused in our different categories of highest qualification aim. For instance, in the regression that estimates the correlation between Provider-level characteristics and *Thin Level 2 and below* value added, we include Prop_BL2 (the proportion of the Provider's total delivery that is Below Level 2) and Prop_L2 (the proportion that is Level 2). This gives an indication of the extent to which a Provider is 'specialising' in the area of delivery being considered.
Low_level_prop_lowreturns ; Low_level_prop_highreturns	Within each category of highest learning aim, we have found (see Bibby et. al., 2014; Cerqua and Urwin, 2015) that some sector subjects have higher returns and some lower returns. These two indicators capture the proportion of a Provider's delivery focused in these 'high return' sectors and the proportion that is located in the 'low return' sectors (referred to later as the '*Balance of Provision*'). When estimating the earnings return equations, these variables capture high and low earnings return sectors; for employment returns, they capture high/low employment return sectors and the same applies for HE returns.

In the analysis of Section 3.1, the focus of interest is on determination of factors that are most important in explaining variation across a 'broadly representative' body of FE

Providers and therefore we retain all FE Providers who are large enough (1,500+ students with outcomes two years after learning) to allow estimation of value added measures. Each set of regression results presented in the Appendix has the findings for this population in the first column and the second column is for the same 'broad' population, but with all those Providers that have ceased operation in recent years dropped from the analysis. The third column of the Appendix Tables only considers Larger FE Providers (5,000+ learners in the regression equations) that are still 'open' in 2013, and these are the results discussed in Section 3.2.

The results of our analysis are presented in two different categories of highest qualification aim:

a) Thin Level 2 and Below: This category corresponds to the two highest learning aim categories of Below Level 2 and Thin Level 2 set out in Bibby et. al. (2014).
b) Full Level 2+: This category corresponds to the highest learning aim categories of Full Level 2, Level 3 and Full Level 3 in Bibby et. al. (2014)[13].

In both our categories of highest learning aims, returns are estimated separately for the constituent highest learning aim category – for instance comparing achievers and non-achievers whose highest learning aim is Thin Level 2 and then separately those whose highest learning aim is Below Level 2. Subsequent to this, we create a weighted average of the two results to create the composite indicator for a particular Provider under a) above. For every individual Provider we consider the number of observations in each of the constituent highest learning aim categories and drop observations for a Provider if they do not reach the required number of individuals (1,500 learners in Section 3.1 and 5,000 in Section 3.2).

Providers are dropped from the analysis if they started teaching one of our (five) specific qualification categories only after 2007. This is mainly because we only have data on earnings up to 2012/2013, and there will be few cohorts for whom outcomes are observed two years on from the end of learning, in Providers where courses first ran in 2008. In addition, this restriction means we are not comparing value added measures across Providers, which are based on widely varying time periods. The cut-off point of 2008 is a compromise, between these considerations and the desire to retain as many of the FE Providers as possible in the analysis.

The supplementary econometric analysis is carried out for the same general population of Providers, but takes a 'between' Provider approach to evaluation. More specifically we take the following approach to selection and estimation:

[13] We do not include Level 4+ learning aims, as these tend to be associated with more specialist provision, and would necessitate an entire study in themselves.

1. First create a dataset that contains only highest aim 'Achievers' across all the Provider analyses carried out (i.e. dropping all non-achievers).
2. Then select all achievers in the relevant highest aim category for Provider A, this then becomes the 'treatment' group (same as in the previous analysis).
3. Select all achievers in Providers that are 'similar' to Provider A (in terms of location, intake, balance of provision[14]) in the relevant highest aim category – these are now the 'control' or 'comparison' group.
4. Estimate the earnings returns for achievers in Provider A, relative to achievers in similar Providers.
5. Carry out the same analysis for Provider B, then Provider C, etc.

This analysis allows us to ask whether, for similar Providers, we see the sort of statistically significant differences in the outcomes of achievers that are implied by the analysis already undertaken. Consider the situation where our existing analysis suggests that value added is much less than expected for Provider A; but Provider B is delivering the value added that we would expect. From the analysis just described, achievers in Provider A should have significantly lower returns than achievers in other similar Providers; and there should be no statistically significant difference between the returns to achievement in Provider B, relative to achievers in similar Providers. The analysis is 'looped', so that we obtain a 'between' estimate for all Providers.

In the conclusion of Section 5 we flag possible future developments and here we flag methodological issues for future consideration:

- When estimating the impact of our Balance of Provision in the Provider-level regression equations, this indicator is potentially endogenous. For instance, it may be that a particular Provider 'chooses' to balance delivery towards less-well-rewarded sector-subject areas because of local labour market factors (i.e. the Provider may simply be responding to local labour demand) or it may indicate a less-well managed provision. These are also the same factors that we might expect to determine average labour market returns (or value added) for the Provider. In future studies we may wish to describe the variation seen across Providers, differentiating according to categories of balance of provision.
- At the individual level, we often have concerns over endogeneity, but these are lessened by our use of non-achievers/drop-outs to estimate counterfactual outcomes. For instance, we are often concerned that individuals who are more able [in ways that are unobservable to the researcher] may select into 'better'

[14] Essentially those characteristics that are seen to be significant in our Provider-level equations in the current draft.

institutions. If this is the case, we would overstate any labour market premium secured by learners in these Providers – as we would attribute the higher earnings returns to Provider efficacy, when part of any premium is actually driven by unobservable selection of the more able into a certain Provider. Comparing achievers with non-achiever/drop-outs in the same Provider ensures that both treatment and control select into the same institution; but our supplementary analysis (comparing achievers across Providers) may suffer from this problem.

- When we consider the literature on School performance indicators (see for instance Parameshwaran and Thomson, 2015), there is some concern over the stability of value added estimates from year-to-year. Generally, we find that value added scores for schools can be less stable over time (because these indicators are necessarily estimated with error). Whilst raw outcomes for an individual school will have an approximate 90% correlation from year-to-year, when considering for instance the proportion of pupils obtaining 5 GCSEs at grade A* to C; this drops to around 70% when considering value added measures that account for the intake to an institution. Our value added measures are pooled across years, so any final indicator can be seen as potentially more reliable. However the discussion in the introduction, drawing an analogy with the gender pay gap, needs to be kept in mind.

- Finally, when considering HE and Employment outcomes we are dealing in percentage point (ppt) differences, and it is possible that such ppt comparison across Providers may be less valid; if we observe substantial variation in the underlying absolute percentages of learners moving on to employment or HE across Providers. Unfortunately, changing all figures to percentages creates the problem that smaller Providers can see wild swings in percentages, from small percentage point changes. Tests suggest that this is not confounding estimates, and we retain the use of percentage points for analysis.

3. Providers and Labour Market Outcomes

This section of the report describes the findings from analysis of the variation in value added across Providers, as measured by the earnings, employment and HE progress premiums of learners. This first analysis covers a broad range of FE Providers, who have at least 1,500 learners in the categories of highest learning aim considered (Below Level 2, Thin Level 2, Full Level 2, Level 3 and Full Level 3) two years after learning; whilst Section 3.2 concentrates on Larger FE Providers (with 5,000+ individuals in each category two years after learning).

As suggested in the introduction, these two approaches allow us to offset the counteracting concerns we may have over (i) the number of learners used to estimate value added for each Provider [with an analysis at the level of the individual learner], versus (ii) the number of Providers in the subsequent Provider-level analysis. Section 3.1 presents results that include more Providers, but necessarily some value added estimates within Providers rely on smaller numbers of learners. In Section 3.2, individual-level regressions that estimate value added contain more learners, but we then have fewer Providers.

3.1 Providers with 1,500 students or more two years from learning

The following Figures present 'raw'[15] value added rankings for Providers, having estimated this from individual-level, achiever V non-achiever/drop-out, regression equations. These Figures provide an indication of which Providers have value added estimates that are different from the average, by showing those that fall outside a 90% 'of the median estimate band'. Around each of these rankings, we discuss the results of a subsequent regression analysis that uses these value added estimates as dependent variables (Y) and a variety of Provider-level characteristics as explanatory variables (X). These results (derived from regression analyses presented in the Appendix) allow us to discuss those Provider-level characteristics (if any) that are most important in explaining the observed variation in Provider-level value added, for this broad group of FE Providers. Section 3.2 concentrates on a category of Larger FE Providers and considers more specific detail on how this Provider-level analysis impacts the value added rankings.

[15] Whilst we usually refer to findings as 'raw' if they have not undergone any econometric manipulation, these are raw in the sense that they do not take into account variation in Provider-level characteristics.

Employment and Higher Education Premiums, two years after learning

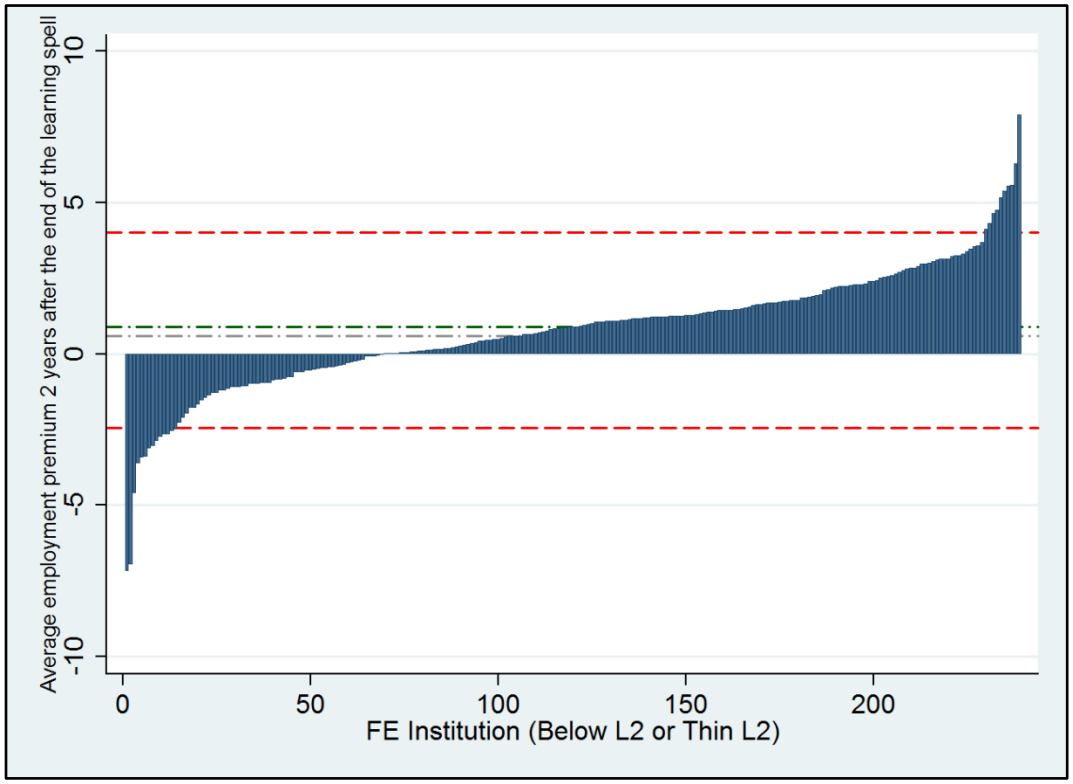
Figures 1 and 2 show how Percentage Point Employment Premiums two years from the end of learning (estimated from separate Achiever V Non-achiever regressions for each Provider[16]) vary from the lowest to the highest-ranked Provider. The approach to presentation is the same in all Figures, with the values for each Provider placed in order from the lowest Provider value at the left of the Figure to the highest on the right. Note that in every figure, the green line shows the median value added, while the grey line reports the value added estimate obtained using the learner-level analysis (from Bibby et. al., 2014).

Figure 1 presents the variation across Providers, for all achieved highest learning aims recorded as either 'Thin Level 2' or 'Below Level 2'; and Figure 2 presents Employment premiums for all achieved highest learning aims recorded as 'Full Level 2' or 'Level 3' or 'Full Level 3'. As we can see, there is substantial variation around the mean and in both Figures there are some extreme outliers. Providers with the most extreme values tend to drop out of the analysis when the minimum student number is raised (see Section 3.2). However, even with the removal of these outliers, potentially driven by smaller numbers in the counterfactual group, the probability of achievers securing employment, relative to non-achievers, still ranges from +4 ppts to -3 ppts in Figure 1; and +10 ppts to -5 ppts in Figure 2.

Of the 239 Providers included in Figure 1, we observe 10 with returns above the upper threshold of our 90% interval, while there are 14 Providers below the lower threshold. Because of the way in which the data are constructed, this cannot necessarily be interpreted as a 90% confidence interval (with only those in the tail being considered 'statistically' significantly different to the median employment ppt of 0.77 two years after learning), but it gives some indication of 'scale'. The grey line represents the weighted average of employment returns from the analysis carried out by Bibby et. al. (2014), made up of 0 ppts for Below Level 2 learning; and 1 ppt for 'Thin' Level 2 learning. More importantly, we observe 70.7% of institutions having positive estimates of value added, out of a total 239 Providers.

[16] Controlling for sex; age; interaction sex-age; ethnicity; disability; region; type of funding (none, LCS, ESF, both); mode of attending (FT/PT); offender; spell duration; number of previous FE learning spells; prior education level; year dummies; Index of Multiple Deprivation (IMD); Indicators derived from Sector Subject Area (SSA); the number of days an individual was on active benefits in the year before learning; whether an individual has an inactive benefit spell in the year before learning; and how many days an individual has spent in sustained (6 months) employment just before learning.

Figure 1 Variation in percentage point employment premiums across ILR Providers[1], two years from the end of learning, for all achieved 'Thin Level 2' or 'Below Level 2' highest learning aims[2]



1 Providers with at least 1,500 individuals having non-missing outcome values 2 years after the end of the learning spell

2 No provider level characteristics taken into account

The second column[17] of Table 4 in the Appendix presents the results of an analysis that has the value added estimates of Figure 1 included as dependent variables in a Provider-level regression, to determine the Provider level characteristics that possibly explain this variation in estimated value added. In this first example, it is perhaps important to identify the characteristics that do not seem to have explanatory power; as well as those that do seem to explain some of the variation.

Thus, the proportion of learners aged 25+ within a Provider; the proportion who are White; the proportion of learners in sector-subjects where we see some of the lowest employment returns; the log of Provider size; the average IMD score of learners within a Provider; the local area unemployment rate; and specific regional indicators, seem to explain little of the observed variation. Similarly, we find no significant impact of our

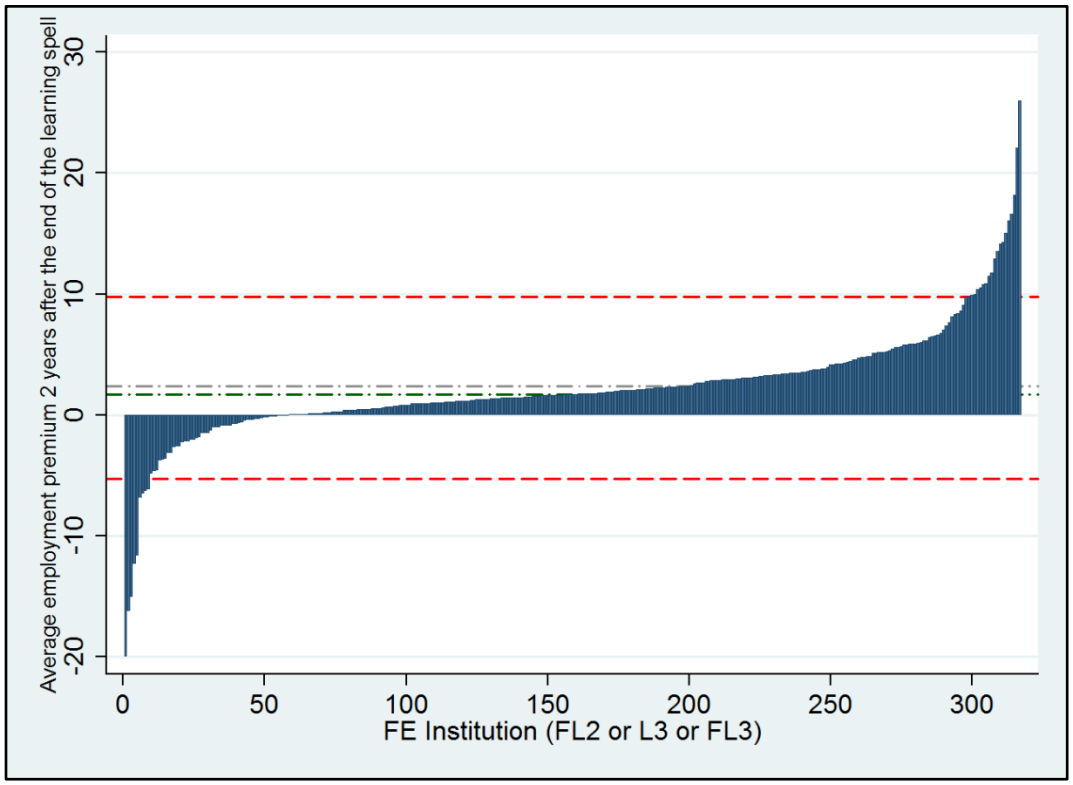
[17] As suggested in the Data and Method section, the first column contains all Providers in the Figures of this Section (that is, all those with 1,500 students or more in the relevant highest aim category); and the second column contains the same population, but with Providers that are no longer operating dropped from the analysis.

indicator that reflects whether a Provider is concentrating (specialising) in learning at Thin level 2 or Below Level 2.

In contrast, the higher the proportion of learners who are studying full time, the higher are our estimated employment returns. Similarly, a larger number of sites is associated with systematically higher returns for this category of highest learning aim (but this is only significant at the 5% level). We also find that Providers with a higher proportion of learners in sector-subjects where we see some of the highest employment returns, are more likely to have (significantly) lower levels of employment value added. This is seemingly counter-intuitive, but is driven by the fact that there are very few sector subjects at Thin level 2 and Below Level 2 that have outstanding performance; whilst the majority have returns of around zero. As we shall see, these findings disappear when we begin to focus on the larger and more recent Providers.

Figure 2 describes the ranking of Providers according to percentage point employment premiums, at highest learning aims of Full level 2 and above. Here we observe a slightly higher proportion of Providers (80.8%) with positive employment premiums, when compared to the lower-level qualifications considered in Figure 1. Of the 316 Providers considered in Figure 2, 20 show employment returns above the upper threshold of our 90% band, while 9 Providers have values below the lower threshold. This variation is around a median employment premium, two years from the end of learning, of 2.23 percentage points. The grey line represents the weighted average of employment returns from the analysis carried out by Bibby et. al. (2014), made up of 2 ppts for Full Level 2; 1 ppt for Level 3; and 4 ppts for Full Level 3.

Figure 2 Variation in percentage point employment premiums across ILR Providers[1], two years from the end of learning, for all achieved 'Full Level 2', 'Level 3' or 'Full Level 3' ILR highest learning aims[2]



1 Providers with at least 1,500 individuals having non-missing outcome values 2 years after the end of the learning spell

2 No provider level characteristics taken into account

The second column of Table 5 in the Appendix presents the results of an analysis that has the value added estimates of Figure 2 included as a dependent variable in a Provider-level analysis. From the discussion around Figure 1, readers can hopefully imply which explanatory variables are not significant in explaining variation in value added across Providers, and therefore we only focus discussion here on those that are significant.

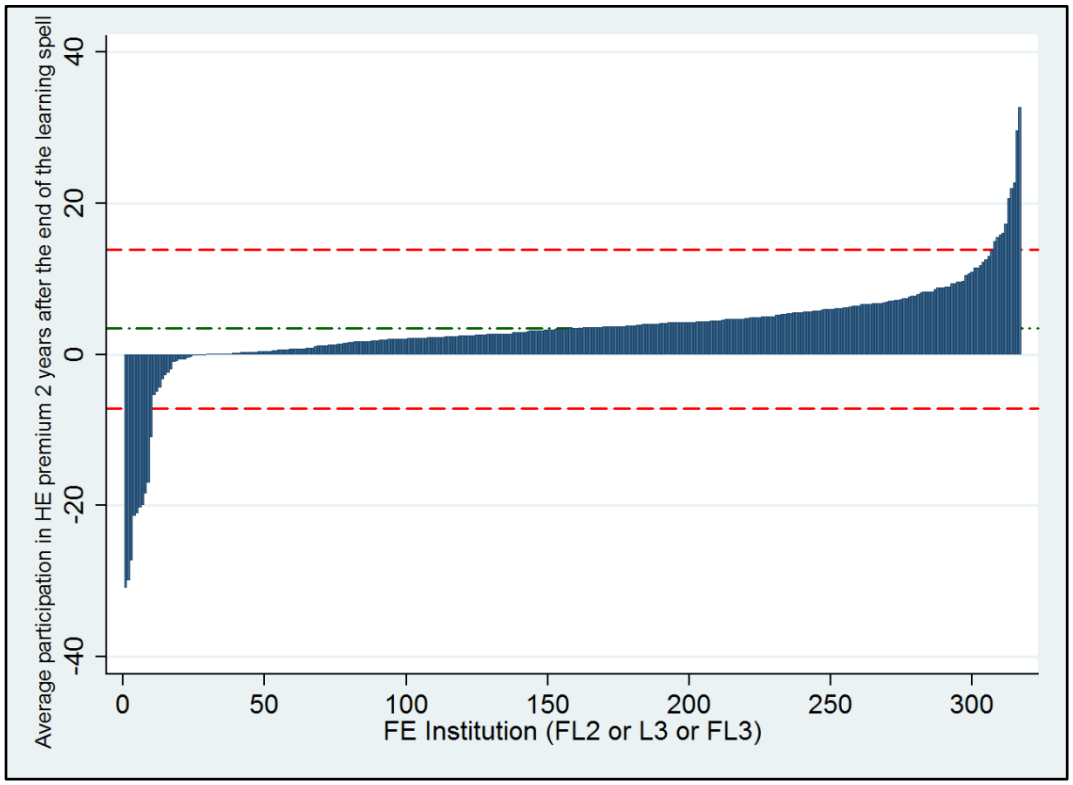
From Table 5, the suggestion is that only one factor is [statistically] significantly correlated with the variation in value added across Providers – the suggestion is that Provider value added is lower, where we observe a high proportion of learners [at FL2+] studying in sector subject areas where we have previously (in Bibby et. al., 2014) estimated low returns. This is the direction of effect that we would expect, but the lack of significance of any other Provider-level characteristics suggests that we may not be capturing the factors that differentiate Provider performance in terms of value added.

Figure 3 presents estimates of the percentage point probability that achievers in certain Providers will Progress to Higher Education [HE] (according to HESA records) within two years of completing their studies, relative to non-achievers. Around 90.2% of the 316 Providers in Figure 3 experience positive premiums (i.e. a situation where achievers in a

Provider are more likely to progress to HE than non-achievers, having controlled for a variety of characteristics), with 10 having a HE premium over the upper threshold, and 10 below the lower threshold. The median HE premium two years from the end of learning (the green dashed line) is 3.37 percentage points, and there are around 100 Providers with a probability that is very close to zero.

Once again, when raising the 'student-size' requirement, we remove some of the most extreme outliers, but estimates still vary between zero and 14 ppts across Providers. We do not present estimated HE probabilities for those whose highest learning aim is Below Level 2 or Thin Level 2, as it is much less relevant as an immediate outcome, for individuals with their highest FE learning at this level.

Figure 3 Variation in the percentage point 'HE Premium' across ILR Providers[1], two years from the end of learning, for all achieving 'Full Level 2', 'Level 3' or 'Full Level 3' ILR highest learning aims[2]



1 Providers with at least 1,500 individuals having non-missing outcome values 2 years after the end of the learning spell
2 No provider level characteristics taken into account

Table 6 (Second column) of the Appendix presents the results of an analysis that has the value added estimates of Figure 3 included as a dependent variable in a Provider-level regression. This suggests that we again have no impacts from our indicators of local unemployment rate; the proportion of 25+ year olds studying [in this qualification category]; the proportion of learners who are 'white'; and the proportion of full-time learners.

However, this equation manages to explain more of the variation in our value added measures, compared to the regression with employment value added as the outcome.

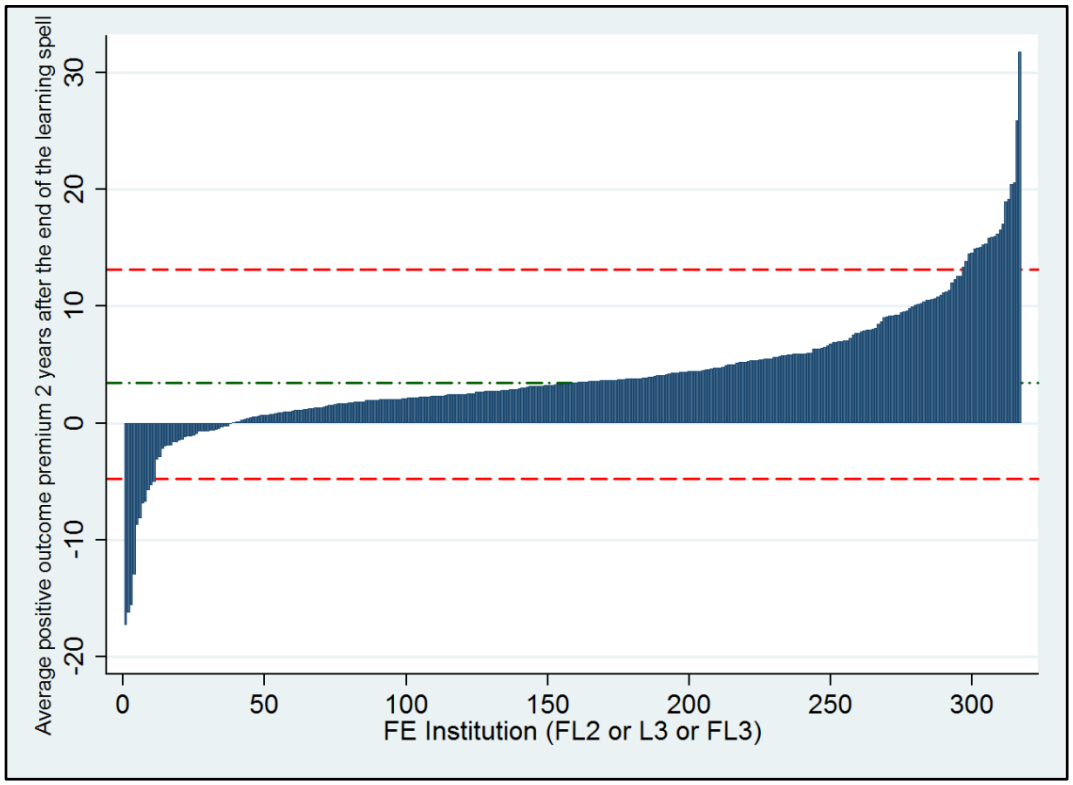
Thus, larger Providers are more likely to have a higher positive value added impact on progression to HE, and Providers in areas with higher IMD scores are also more likely to achieve a higher HE value added. This latter result, is in line with the findings from Bibby et. al. (2015b), where we find that FE is a particularly important route to HE for learners facing higher levels of local disadvantage. Providers located in the South have significantly higher HE progression probabilities, when compared to those located in the North of England. Also, Provider value added is lower, where we observe a high proportion of learners [at FL2+] studying in sector subject areas where we have previously (in Bibby et. al., 2014) estimated low returns; and those Providers with a higher proportion of delivery undertaken as highest learning aims of Level 3 (though not as Full Level 3), are most likely to see high proportions of students progressing to HE.

It is important to note that when considering Figures 1 and 2, we have regression equations that model a 'one/zero' dichotomous dependent variable[18], taking a value of 'one' when the individual is in employment two years after learning and 'zero' otherwise – in this situation, the employment premium for some Providers with large numbers of individuals progressing to HE could be dragged down (as progress to HE is coded as 'zero'). This is clearly much less of an issue for Figure 1 than for Figure 2; and in Figure 3 we have a situation where employment outcomes will be coded as zero. We still wish to see the outcomes from Figures 2 and 3, but also need to consider them next to the ranking in Figure 4, which captures the outcome from regression equations that model a one-zero dichotomous variable that is 'one' if we observe the individual in either (i) employment two years after learning and/or (ii) a HE transition within two years from the end of learning.

This outcome is only presented for higher level learning aims, as incorporation of HE destinations at Thin Level 2 and Below Level 2 has no impact on the ranking of employment premiums presented in Figure 1. As Figure 4 suggests, there is still a substantial amount of variation in returns across Providers when considering the ranking of this 'positive outcome' measure. Of the 316 Providers included in Figure 4, 21 have positive outcome returns above the upper threshold, and 11 below the lower threshold, with the 90% band located around a median of 4.18 ppts and 87.7% of institutions having positive premiums.

[18] The regressions with binary dependent variables are also estimated using OLS, resulting in a linear probability model (LPM). Such models have the disadvantage that out-of-bound predictions can occur (probabilities greater than 1 or less than 0) and also suffer from heteroskedasticity. However, the sheer size of these data make logit/probit modelling with marginal effects highly computationally intensive; particularly as our identification strategy requires each qualification level to be estimated in its own regression equation, for each separate Provider. LPM models generally performed well and we report robust standard errors.

Figure 4 Variation in the 'Positive Outcome' Premium (i.e. Employment and/or HE), within two years from the end of learning, across Providers[1], for all achieved 'Full Level 2', 'Level 3' or 'Full Level 3' ILR Highest learning aims[2]



1 Providers with at least 1,500 individuals having non-missing outcome values 2 years after the end of the learning spell
2 No provider level characteristics taken into account

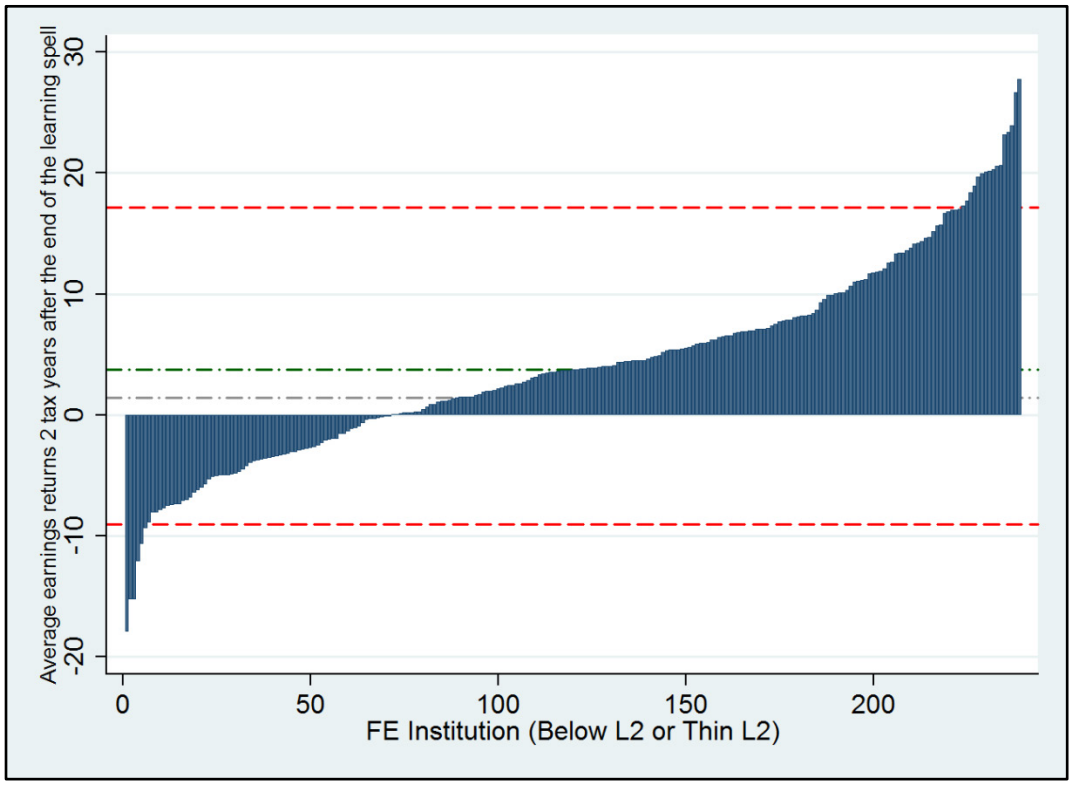
Table 7 (second column) of the Appendix presents the results of an analysis that has the value added estimates of Figure 4 included as a dependent variable in a Provider-level analysis. The suggestion is that Providers with a higher proportion of learners aged 25+ are more likely to experience systematically lower 'positive outcome' returns - something that is driven by the employment aspect of our dependent variable. However, as with the employment value added equations, we again find that very few of our explanatory variables are significantly correlated with Provider value added.

Earnings Premiums, two years after learning

Figures 5 and 6 show how the percentage Earnings Premium (estimated from separate Achiever V Non-achiever regressions for each Provider) varies from the lowest, to the highest-ranked Provider. Figure 5 presents the variation across Providers, for all achieved highest learning aims recorded as either 'Thin Level 2' or 'Below Level 2'; and Figure 6 presents earnings premiums for all achieved highest learning aims recorded as 'Full Level 2' or 'Level 3' or 'Full Level 3'. In each of these earnings return equations, we have dropped from the analysis all learners who are observed in Higher Education at any point during the three years from the end of learning (as we now have data that overcome the 'HE flag' issues raised in previous studies, for instance Bibby et. al. 2014).

In Figure 5 the ranking of these earnings value added estimates, leaves us with a substantial number of Providers securing estimated returns that are negative; and even with the removal of outliers, we still have around 100 Providers securing, at best, an average earnings return that is only just above zero. In contrast, 69.9% of the 239 Providers in Figure 5 have positive premiums; 16 have earnings returns above the upper threshold; and 6 below the lower threshold – with the 90% band created around a median 4.05 percentage earnings return two years from the end of learning. The grey line represents the weighted average of earnings returns from the analysis carried out by Bibby et. al. (2014), made up of 2% for Below Level 2 learning; and 1% for 'Thin' Level 2 learning.

Figure 5 Variation in second year percentage earnings premiums across ILR Providers[1], for all achieved 'Thin Level 2' or 'Below Level 2' ILR highest learning aims[2]



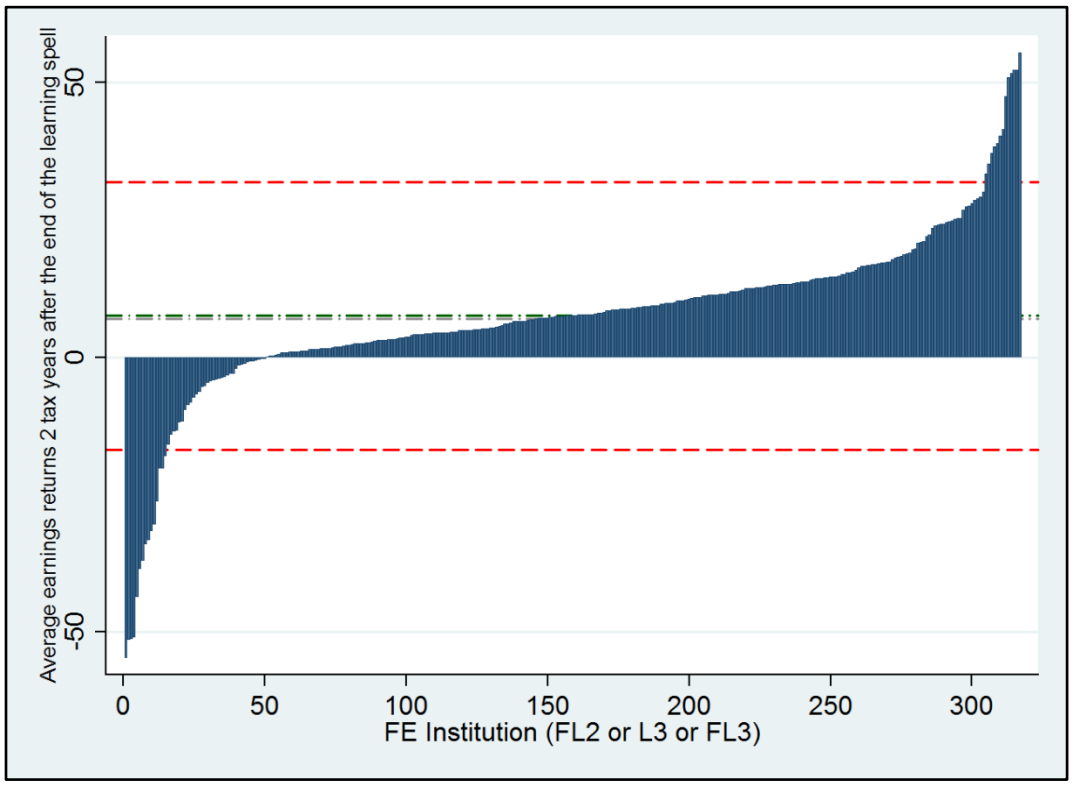
1 Providers with at least 1,500 individuals having non-missing outcome values 2 years after the end of the learning spell
2 No provider level characteristics taken into account

Table 8 (second column) of the Appendix presents the results of an analysis that has the value added estimates of Figure 5 included as a dependent variable in a Provider-level analysis. The results suggest that, the higher the proportion of learners who are aged 25+, the lower are our estimated earnings returns (though this is only significant at the 5% level); and the same negative relationship is also evident for the proportion of FT learners. As we would expect, a higher proportion of learners studying in sector subject areas that are typically associated with higher earnings returns, is highly correlated with higher average earnings returns within the Provider; whilst a higher proportion of learners studying in lower-earning sector subject areas, is correlated with lower average earnings returns, but the latter effect is not statistically significant. Interestingly, we find that

Providers with a larger number of sites (in addition to the size variable) have systematically higher average returns, though the effect is only significant at the 5% level.

Figure 6 contains some particularly extreme outliers at the bottom end of our ranked Providers, but these are removed when we limit the analysis to the largest providers. Once again we have close to 100 Providers securing, at best, an average earnings return that is only just above zero; although 83.9% of Providers do secure positive average earnings premiums. Of the 316 Providers in Figure 6, 13 have earnings returns over the upper threshold, while 15 are below the lower threshold; and this 90% 'band' is created around a median earnings return of 7.55 percent, two years after the end of learning. The grey line represents the weighted average of earnings returns identified in Bibby et. al. (2014), made up of 11% for Full Level 2; 3% for Level 3; and 9% for Full Level 3.

Figure 6 Variation in Second Year percentage earnings premiums across ILR Providers[1], for all achieved 'Full Level 2', 'Level 3' or 'Full Level 3' ILR highest learning aims[2]



1 Providers with at least 1,500 individuals having non-missing outcome values 2 years after the end of the learning spell
2 No provider level characteristics taken into account

Table 9 (second column) of the Appendix presents the results of an analysis that has the value added estimates of Figure 6 included as a dependent variable in a Provider-level analysis. The results suggest that a higher proportion of learners studying FT is associated with lower earnings returns at the level of Provider. As we found when considering Figure 5, a higher proportion of learners studying in sector subject areas that are typically associated with lower earnings returns, is correlated with lower average earnings returns within the Provider; but again the effect is not statistically significant. In the first column (which contains some Providers that have ceased operation) there is

some suggestion that a larger number of sites is associated with lower average earnings returns within the Provider, but this is not a statistically significant correlation in the second column.

Correlations between Outcome and Pass Rate across providers

In the appendix to this report we present the rankings of pass rates (number of learners achieving their highest learning aim divided by the overall number of student enrolments) across Providers, for our two categories of highest qualification aim. We present the variation in pass rates across Providers, as we wish to rule out the possibility of correlation between pass rates and Employment/HE Premiums across Providers. This is something that would raise concerns, not least because is has implications for our identification strategy. Figures 19 and 20 of the Appendix suggest that the majority of Providers have a pass rate of between 60% and 80%.

For our identification strategy to have validity, non-achievement/drop-out needs to be largely random, having controlled for a variety of individual-level characteristics (as described in Urwin et. al. 2014 and the underpinning assumption in Jepsen, et. al. 2014). One implication of this, is that there should be no relationship between Provider drop-out/non-achievement rates and Provider-level labour market outcomes.

One can think of situations where this might not be the case. It could be that some Providers are associated with much higher drop-out rates, which then impact our estimate of employment and earnings premiums. For instance, if non-achievement/drop-out is concentrated amongst the less able individuals within a particular Provider, lower levels of drop-out might actually flatter estimated employment premiums. In situations where Provider X has more of its marginal students in the achiever group (leaving only the very least able in the control group); and Provider Y has more of these students in the non-achieving/drop-out group, estimated employment returns may be higher in Provider X.

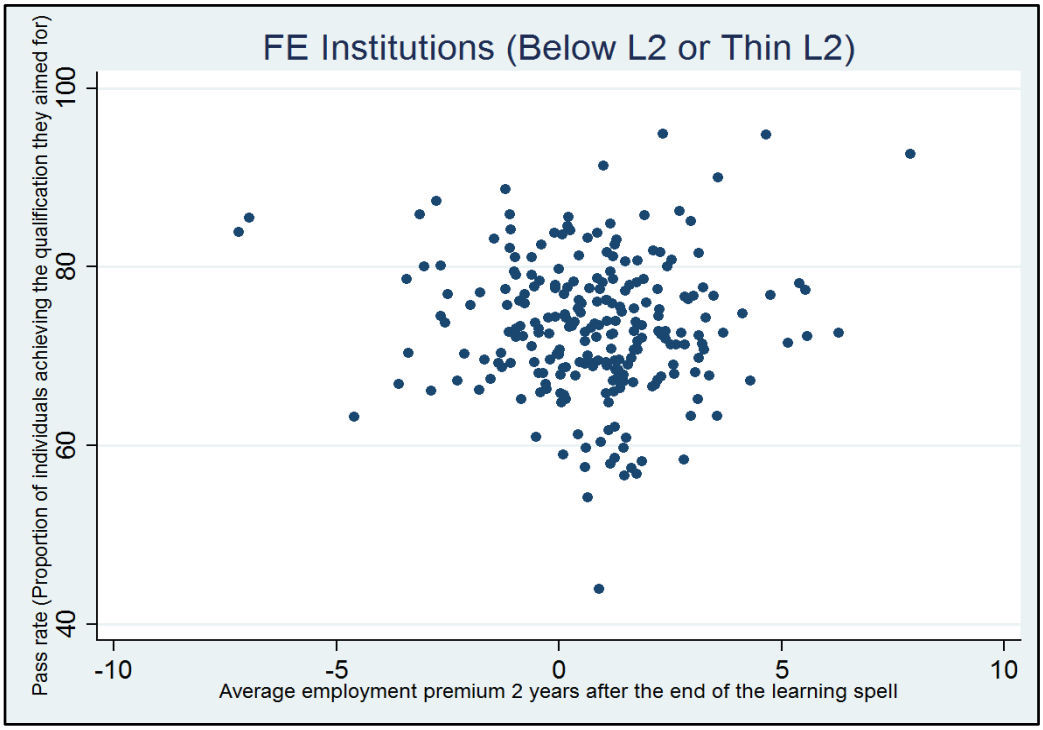
The exact translation of any achievement rate into employment or earnings outcomes would depend on the nature of any hypothesized underlying ability distribution – the example we give here, assumes that the underlying ability distribution is linear and directly proportional to observed employment probability. This does not necessarily have to be the case - any systematic relationship between our Provider-level labour market outcomes and non-achievement/drop-out, would call into question the approach to estimation of value added.

As we can see from the following three scatter plots in Figures 7, 8 and 9, there is no clear relationship between Provider Premiums and drop-out rates. More specifically, Figures 7 and 8 show the scatter plots of Provider Employment Premiums and Pass Rates (for our two categories of Highest Learning Aim). If some Providers were associated with systematically higher pass rates, which then boosted estimated

employment returns, we would observe a pattern that was upward sloping from left to right in both Figures.

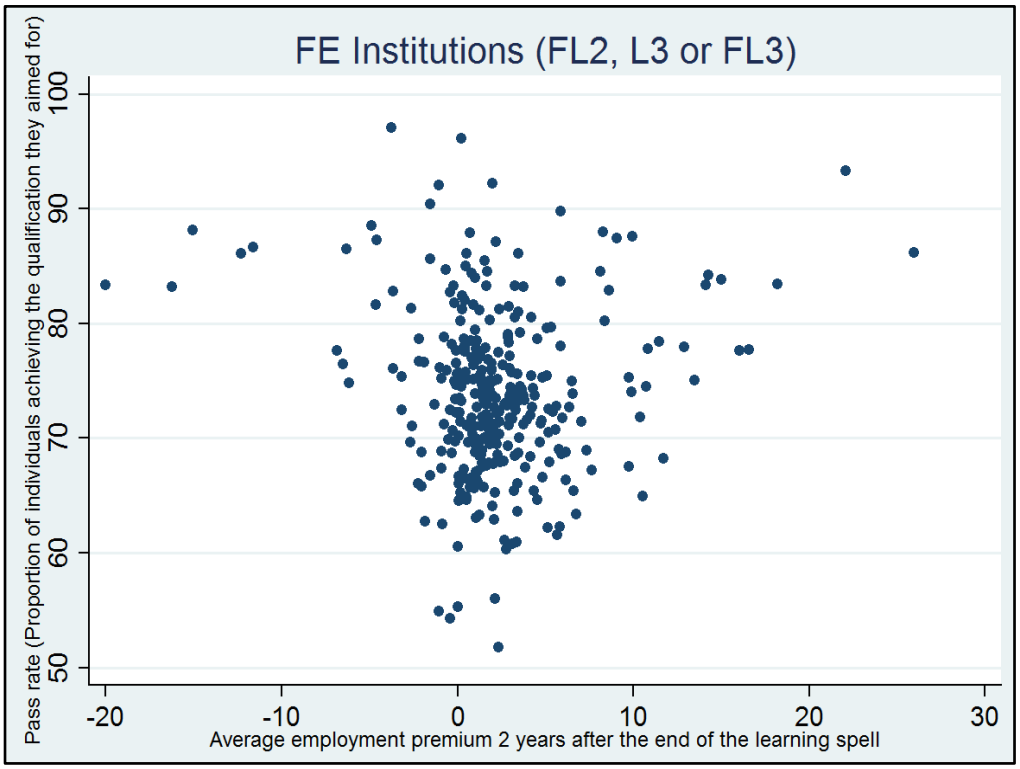
As it is, we cannot reject the null hypothesis that the correlation coefficient is zero, at the 95% level. However, we can see that some of our more extreme outlying employment premiums are associated with vanishingly small failure rates – another factor that drives us to focus only on the largest Providers in the next section of the report.

Figure 7 Scatter plot of (i) the variation in second year employment premiums across Providers[1] and (ii) the pass rate for the Provider; for all achieved 'Thin Level 2' or 'Below Level 2' ILR highest learning aims



1 With no provider level characteristics taken into account

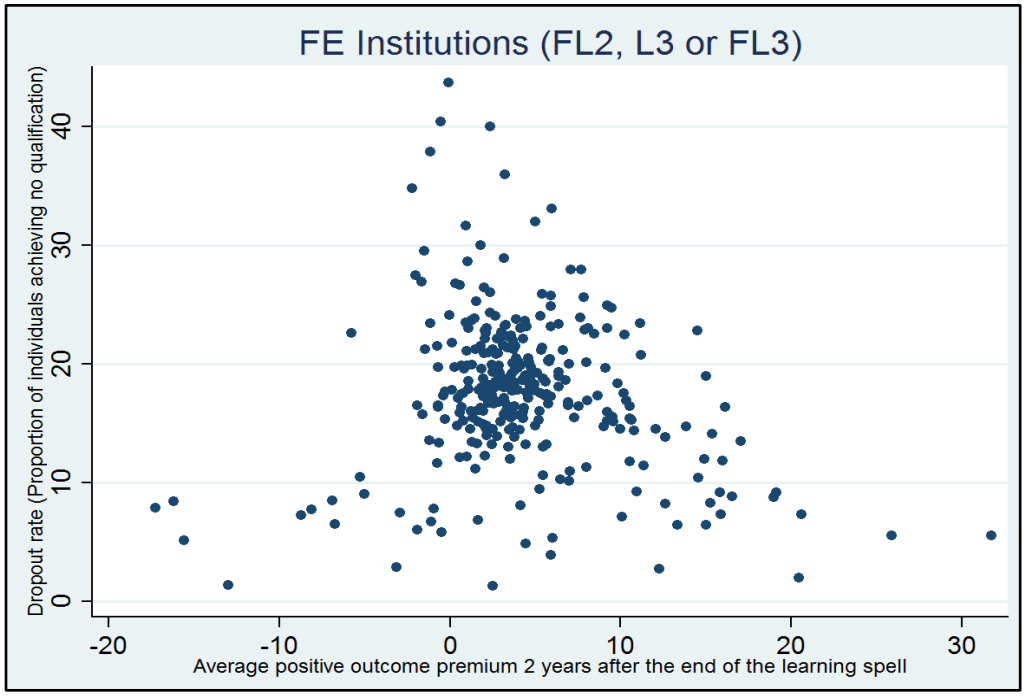
Figure 8 Scatter plot of (i) the variation in second year employment premiums across Providers[1] and (ii) the pass rate for the Provider; for all achieved 'Full Level 2', 'Level 3' or 'Full Level 3' ILR highest learning aims



1 With no provider level characteristics taken into account

Finally Figure 9 shows the relationship between our 'Positive Outcome' indicator (of either a destination to HE or Employment within two years) and Drop-out Rates, across Providers. In this example, if some Providers were associated with systematically lower drop-out rates, which then boosted estimated 'Positive' Premiums, we would observe a pattern that was downward sloping from left to right. Overall there is no significant correlation between the two indicators, but we do have some outliers with high 'positive outcomes' potentially driven by drop-out rates that are close to zero – again, acting as an additional motivation to concentrate on the larger Providers in Section 3.2.

Figure 9 Scatter plot of (i) the variation in second year Positive Outcome premiums across Providers[1] and (ii) the Drop Out rate for the Provider; for all achieved 'Full Level 2', 'Level 3' or 'Full Level 3' ILR highest learning aims



1 With no provider level characteristics taken into account

3.2 Providers with 5,000 students or more two years from learning

Section 3.1 gives a much clearer idea of those Provider-level characteristics that can explain variation in value added across a more representative group of FE Providers. Considering the entire sample of Providers in Section 3.1, we have more opportunity to capture the full distribution of value added, but the inclusion of relatively small Providers could call into question some of the specific individual Provider estimates – especially those at extremes of the rankings. In contrast, this section of the report focuses only on Providers where we have 5,000 students or more to use in individual-level regression equations that estimate initial value added. Therefore we feel more confident in going further and comparing the 'raw' value added in each Provider (from individual level regressions); with what we would expect having accommodated Provider level characteristics (in the Provider-level analysis).

This section considers only those Larger Providers from the previous section, for whom we observe outcome values two years from the end of learning for at least 5,000 individuals within the relevant highest learning aim. We then present, for each category of highest learning aim and value added,

1. Provider rankings according to the earnings, employment and HE value added for the different categories of highest learning aim, before accommodating any Provider-level differences. These value added estimates are in BLUE in the following Figures and are similar to previous

figures [Section 3.1] which present value added estimates with no provider level characteristics taken into account.

2. Each of these Figures also presents the level of expected value added, after accommodating Provider-level characteristics. These value added estimates are presented in orange and any gap between actual value added and expected is investigated in Section 4; which considers any remaining differences between (i) Providers securing value added well above the expected level, (ii) those securing around the level expected and (iii) those securing well below the expected level.
3. Once again, we refer to the Appendix where regression results from our larger Provider-level analysis (in the third column of each Table), allows comment on the most significant factors that explain differences between 1 and 2.

For instance, Figure 10 ranks the percentage point employment premiums associated with highest learning aims of Thin Level 2 or Below, for the 100 largest FE Providers. The ranking in blue is the initial estimation of value added across these larger Providers, obtained from the individual-level achiever V non-achiever regression equations, which take no account of Provider-level characteristics. As we would expect, there are fewer outliers (than in Section 3.1), but value added estimates still vary from around -2 to +4 ppts.

The orange columns that are superimposed on this blue ranking, reflect the estimate of expected value added, given the Provider's characteristics. As we can see, the majority of higher-ranked Providers are securing value added that is more than double the expected level suggested by the Provider-level regression analysis; whilst our Provider-level results 'expect' negative returns from only five of the Providers that are actually securing negative returns[19]. At the other end of the rankings, Providers with the eighth, ninth and tenth-highest blue value added rankings, are securing high levels of value added, but the return is around that predicted by the Provider-level model.

[19] There will be individuals securing positive returns within these institutions, as this is an average across all learners within the specific Provider. Despite this, the existence of negative returns for a Provider is still of some concern, whether 'expected' or not. However, the aim here is to identify those Providers who are doing much worse or better than expected, and this is an approach we retain for the current study.

Figure 10 Variation in percentage point employment premiums across larger ILR Providers[1], two years from the end of learning, for all achieved 'Thin Level 2' or 'Below Level 2' highest learning aims[2]

1 Providers with at least 5,000 individuals having non-missing outcome values 2 years after the end of the learning spell.
2 Before and after controlling for provider level characteristics.

The third column of Table 4 in the Appendix presents the results of an analysis that has the blue value added estimates of Figure 10 included as dependent variables in a Provider-level analysis – and this provides us with the expected value added estimates in orange. To remind readers, controlling for more and more Provider-level characteristics, we would expect the [conditional] distribution of value added across Providers to 'narrow' and ultimately, all the variation may be explained, so that there are no remaining differences between Providers. In contrast, if there is still significant variation in the value added of Providers after controlling for all observable differences, we may infer that any remaining differences reflect variation in efficacy across Providers (though we must also remember that all such statistical measures are estimated with error). In Figure 10, a situation where all variation in value added can be explained by Provider-level characteristics, would be reflected by a situation where each orange column would be identical to the blue column – that is, each Provider would be delivering the value added expected of them, given their Provider-level characteristics.

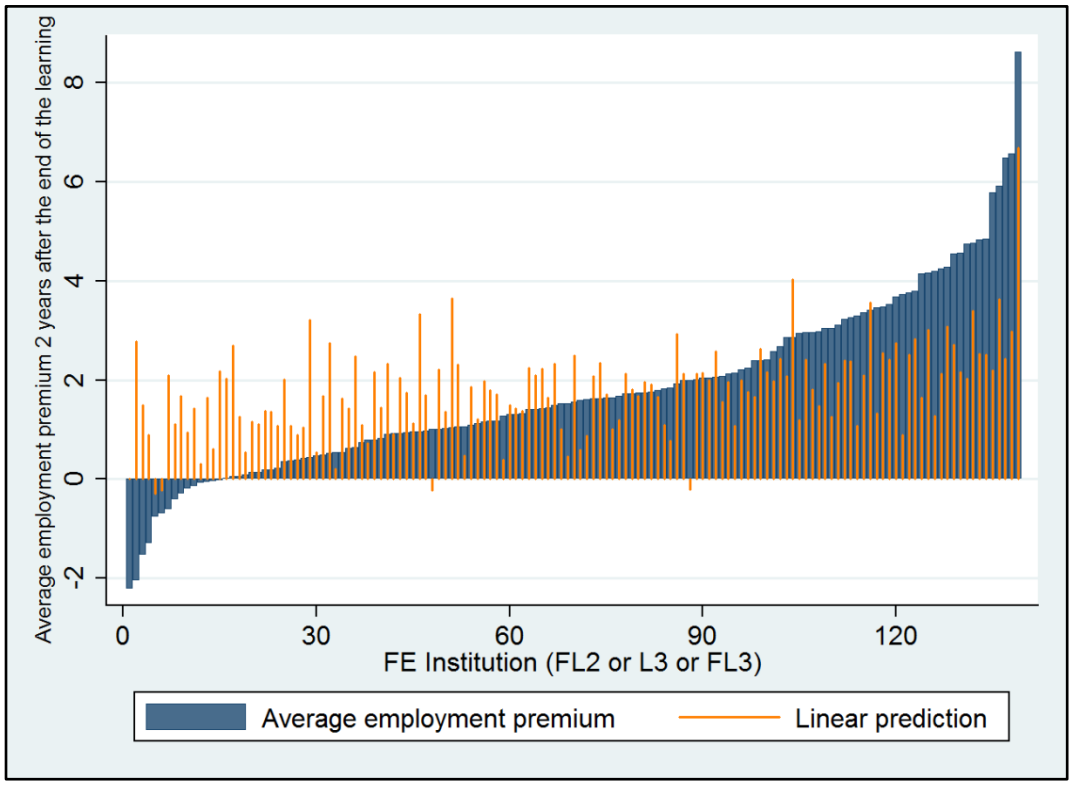
Some of the results from column 3 of Table 4 are similar to those in Section 3.1 (where we consider a larger population of Providers). For instance, we still find that a higher proportion of learners studying full time, is associated with higher estimated employment returns. However, there are a number of differences when we only focus on these larger

Providers. For instance, we now find that a higher proportion of 'white' learners is associated with higher returns, though the effect is only significant at the 5% level. However, we also now find that those Providers with a high proportion of their delivery focused on Thin Level 2 highest learning aims, have significantly lower employment returns; and even more confounding, we find that those Providers with a higher proportion of learners in low-employment-return sector subjects, are associated with higher average employment returns.

Figure 11 presents the unadjusted and adjusted rankings of Provider value added across our FL2+ highest learning aims. Once again, the majority of higher-ranked Providers are achieving levels of value added far beyond that predicted by the model, but even here there are a few who are delivering slightly less than the expected, given their characteristics. Interestingly, for the top ranked Provider [which is something of an outlier], the estimate of expected value added having taken into account Provider-level characteristics, is also something of an outlier – this Provider is providing excellent returns, but its characteristics suggest that this is something we would expect.

There are five examples of orange estimated negative value added and one or two Providers delivering close to zero or negative value added, who are actually doing better than expected, given their characteristics. In Section 4 any group that is delivering close to its expected level (whether this expected level is positive, negative or zero) is classed as 'middle ranked', when compared to those achieving well above ['top ranked'] or well below ['bottom ranked']. Table 5 of the Appendix suggests that when considering only the larger Providers in Figure 11, we still see a negative impact for Providers with a high proportion of learners aged 25+. In addition we identify a positive impact of being located in London (as opposed to the North of England), and a positive impact for Providers whose provision is skewed towards high-return sector subject areas.

Figure 11 Variation in percentage point employment premiums across larger ILR Providers[1], two years from the end of learning, for all achieved 'Full Level 2', 'Level 3' or 'Full Level 3' ILR highest learning aims[2]

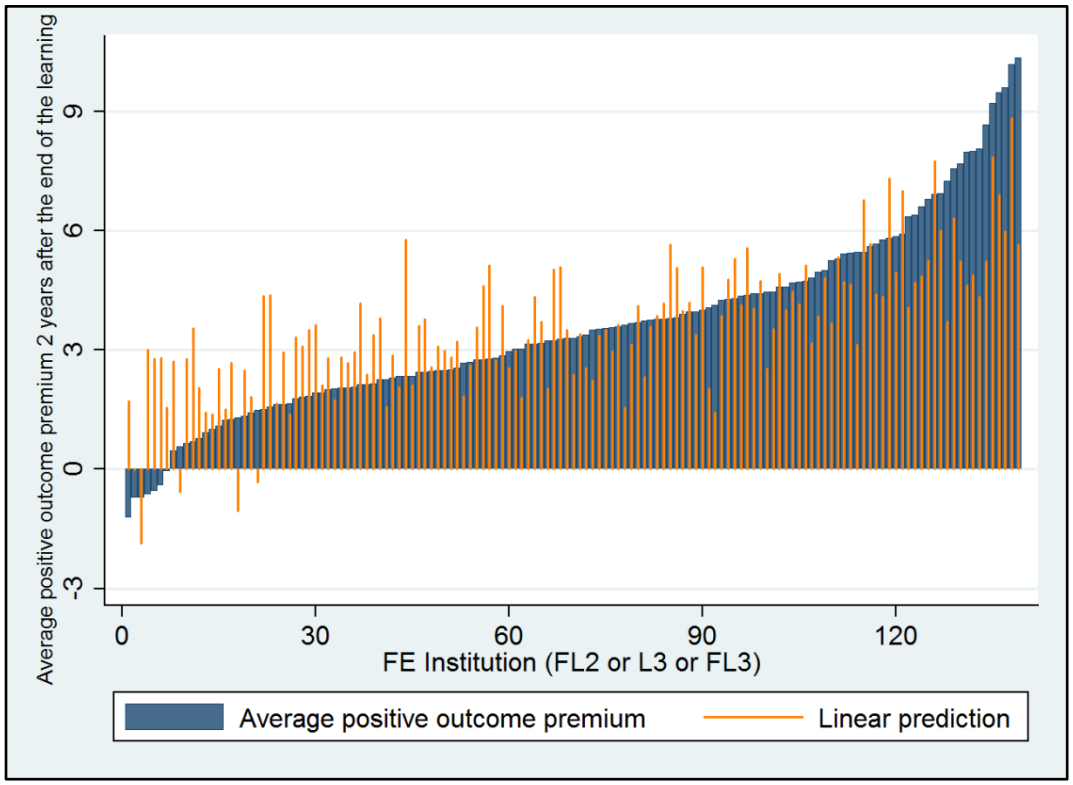


1 Providers with at least 5,000 individuals having non-missing outcome values 2 years after the end of the learning spell
2 Before and after controlling for provider level characteristics

When considering variation in FE Provider value added, in the context of FL2+ highest learning aims leading to HE, Figure 12 seems to suggest more of an alignment between actual and expected value added (though the change of scale and outcome measure does leave comparisons a little difficult). There are clearly a number of low-ranked Providers whose estimated value added is much less than expected from the Provider-level analysis; and the converse is true towards the top end of the rankings – however, this mismatch seems less pronounced than in previous Figures.

Turning to the third column in Table 6 of the Appendix, we observe quite a change in the factors that are significantly correlated with larger Providers (compared to Section 3.1). For instance, the Provider-level regression equation suggests that a higher proportion of FT learners is associated with a higher HE premium in Providers; we have some evidence (at the 5% level) that Providers in *Yorkshire and The Humber* have higher HE progression premiums than Providers in the North of England; and a higher proportion of FL3 provision within the Provider is also associated with higher HE progress premiums. These are all factors that were not significantly correlated with value added when we considered the wider population of FE Providers in Section 3.1.

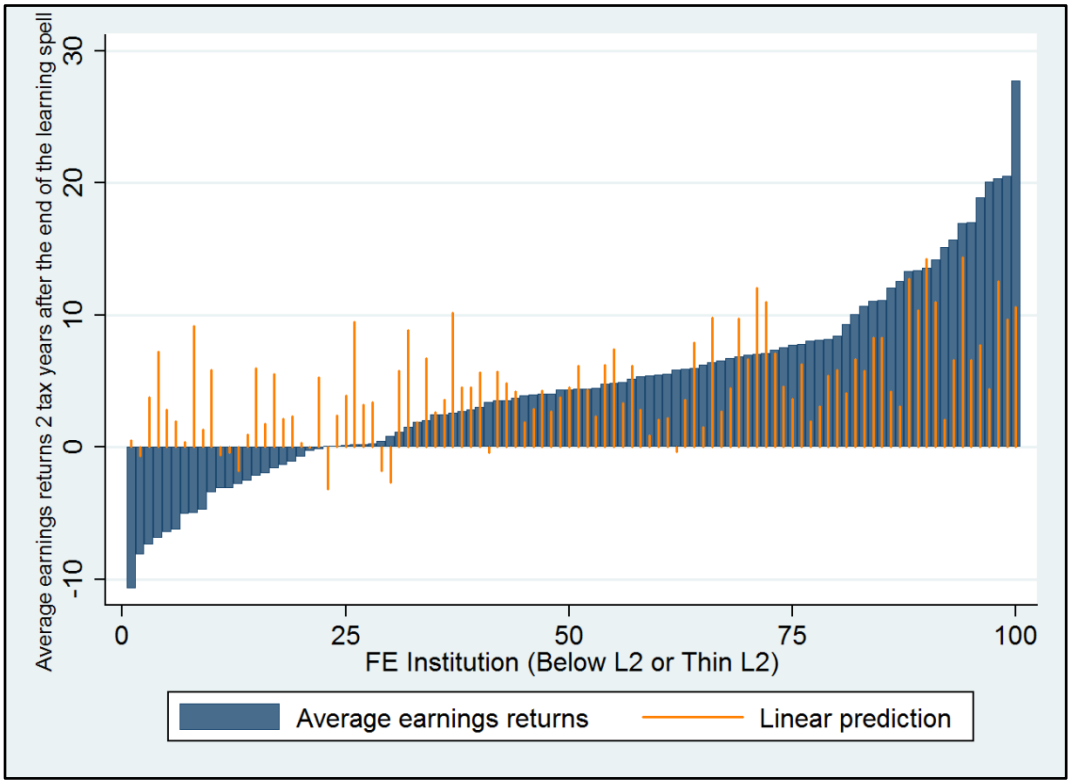
Figure 12 Variation in the percentage point 'Positive Outcome' Premium (i.e. Employment and/or HE), within two years from the end of learning, across larger ILR Providers[1], for all achieved 'Full Level 2', 'Level 3' or 'Full Level 3' ILR highest learning aims[2]



1 Providers with at least 5,000 individuals having non-missing outcome values 2 years after the end of the learning spell
2 Before and after controlling for provider level characteristics

Figures 13 and 14 complete this section of the report with a consideration of earnings value added. In Figure 13 there are a number of low-ranked Providers, achieving low value added estimates that are nonetheless higher than predicted by the Provider-level analysis. However, we once again observe many Providers achieving either much lower, or much higher, value-added than expected given their Provider-level characteristics.

Figure 13 Variation in Second Year percentage earnings premiums across larger ILR Providers[1], for all achieved 'Thin Level 2' or 'Below Level 2' ILR highest learning aims[2]



1 Providers with at least 5,000 individuals having non-missing outcome values 2 years after the end of the learning spell
2 Before and after controlling for provider level characteristics

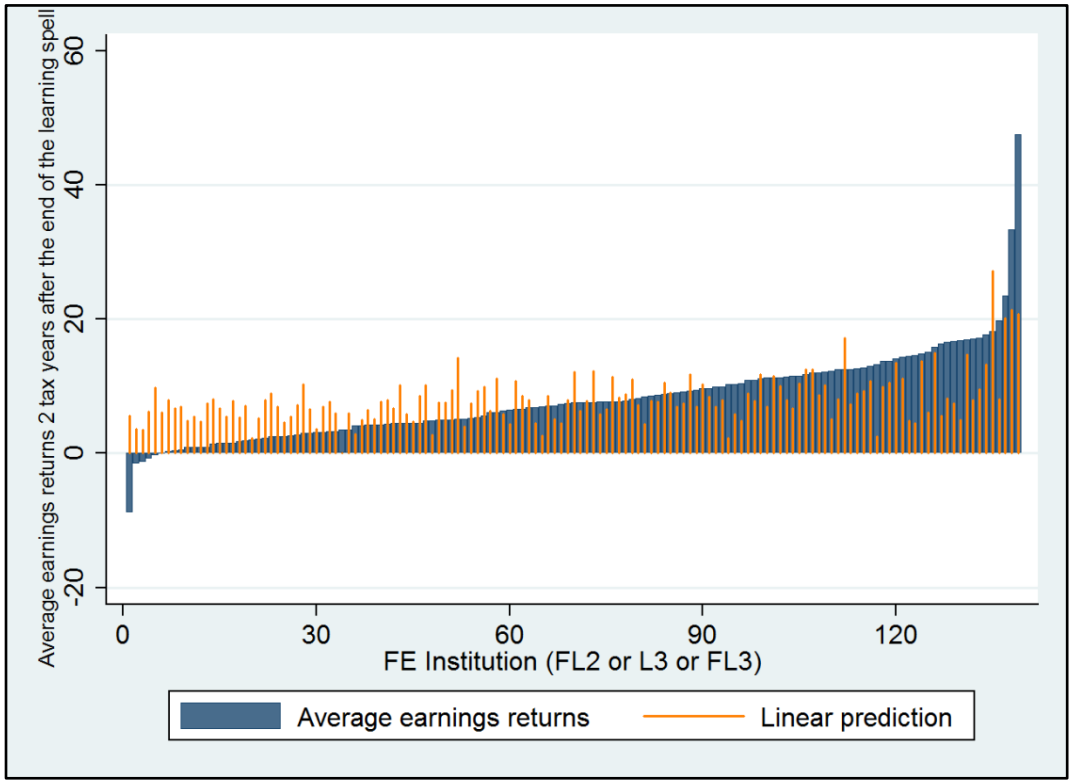
Table 8 (third column) of the Appendix presents the results of an analysis that has the [blue] value added estimates of Figure 13 included as dependent variables in a Provider-level analysis – and this provides us with the expected value added estimates in orange. Here we find that having a higher proportion of learners who are white is associated with significantly lower earnings returns across Providers; that larger Providers are more likely (at the 5% level) to experience lower value added, but a larger number of sites is correlated with higher levels of value added.

Finally, Figure 14 suggests that once again there is a lot of variation in earnings value added that is not explained by Provider level characteristics – and here we observe no Providers with expected returns substantially below zero. Table 9 of the Appendix suggests a [positive] significant impact of having a greater balance of provision towards higher-earnings-return sector subjects within the Provider, and this is significant at the 1% level. Also, those Providers located in the East of England have systematically lower earnings returns, when compared to Providers located in the North of England. Having a greater balance of delivery towards L3 highest learning aims, is strongly associated with substantially lower average earnings returns.

Interestingly, this is the only time that the unemployment rate is significantly correlated with value added, and the suggestion here is that a higher local unemployment rate is

associated with a higher average earnings return; whilst a higher IMD score is associated with a lower level of value added. There are many possible explanations for these findings, for instance high local unemployment rates could force learners achieving these higher learning aims to look further afield for jobs, and this could raise wages. However, this is one amongst many possible explanations and more work is needed before specific conclusions can be drawn.

Figure 14 Variation in Second Year percentage earnings premiums across larger ILR Providers[1], for all achieved 'Full Level 2', 'Level 3' or 'Full Level 3' ILR highest learning aims[2]



1 Providers with at least 5,000 individuals having non-missing outcome values 2 years after the end of the learning spell
2 Before and after controlling for provider level characteristics

4. Characteristics of bottom and top-ranked Providers

This section considers differences between the highest and lowest ranked Providers, in terms of characteristics used in the [large] Provider-level regressions estimated in Section 3.2 – taking into account the outcomes of both the 'within' Provider approach to estimation, and the supplementary 'between' Provider approach to estimation, described in the Method. To remind readers, our supplementary econometric analysis is carried out using the same general population of large Providers, but takes a 'between' Provider approach to evaluation. More specifically we take the following approach to selection and estimation:

- First create a dataset that contains only highest aim 'Achievers' across all the Provider analyses carried out (i.e. dropping all non-achievers).
- Then select all achievers in the relevant highest aim category for Provider A, this then becomes the 'treatment' group (same as the 'within' Provider approach to analysis).
- Select all achievers in Providers that are 'similar' to Provider A (in terms of location, intake, balance of provision) in the relevant highest aim category – these are now the control or comparison group.
- Estimate the earnings returns for achievers in Provider A, relative to achievers in similar Providers.
- Carry out the same analysis for Provider B, then Provider C, etc.

This analysis allows us to ask whether, for similar Providers, we see the sort of statistically significant differences in the outcomes of achievers that are implied by the analysis detailed in the report to this point. In this Section we report Tables of descriptive statistics across the top-, bottom- and middle-ranked Providers. The group of top-ranked Providers have (i) earnings premiums that are more than one standard deviation above their expected level, as predicted by the average of the 'between' and 'within' Provider-level analyses; and (ii) an average positive-outcome that is estimated to be positive [across the between and within Provider analyses]. The bottom-ranked Providers have (i) an earnings value added [averaged across the two analyses] that is more than one standard deviation below the level expected and (ii) an average of the two positive outcomes estimates that is negative. The middle-ranked are within one standard deviation of that which is expected, and/or take on conflicting values of earnings and positive outcomes estimates across the two sets of analyses.

4.1 The characteristics of high and low ranked Providers

Table 2 gives some indication of the differences in characteristics that remain between those Providers that achieved Thin level 2 and below earnings returns substantially (one standard deviation) below the level expected; those that achieved around the expected level and those that secured much higher returns than expected. Consideration of Table 2 serves as a check of outcomes from the Provider-level analysis – if the regression

equation has been effective in accommodating observables differences, the three groups should look similar – and it also provides additional insights into our findings. If we find few remaining differences in characteristics between Providers, the suggestion is that differences in value added are more likely due to unobservable factors related to Provider efficacy. If we find substantial differences between the three groups of Provider, the suggestion is that unobservable differences are more likely related to location and other 'environmental' factors, beyond the Provider's control. The focus of Table 2 and Table 3 is on those factors that (i) have some significant impact in the regressions of Sections 3.1 and 3.2 and/or (ii) exhibit some remaining differences between high, middling and lower achievers.

From Table 2, there is still some remaining correlation between Provider performance and the proportion aged 25+ (with a higher percentage aged 25+ still associated with lower value added). However, the differences are not statistically significant. In contrast, the higher-ranked Providers have an average IMD score (28.6) that is (statistically) significantly higher, when compared to both the middle- (24.9), and lower-(24.2), ranked Providers (all such statistically significant differences are highlighted in yellow). Similarly, a higher local unemployment rate is still more likely to be observed for higher-ranked Providers, but this is not significant.

There is still some [statistically significant] tendency for the lower-ranked Providers to have a greater focus of provision at Below Level 2 (40.2%) and L2 (18.1%) when compared to the mid-ranked; but in the case of Below Level 2, this is also true of the higher-ranked (38%), when compared to the middle ranked (32%). A similar thing is happening when we consider the proportion located in the South, where both highest and lowest ranked have higher proportions located. Finally, we have also matched OFSTED scores into the data and present the average score amongst our three Provider groups – there is no statistically significant correlation, though the highest-ranked Providers do score slightly higher in OFSTED (as the highest score is 1). The final part of this Section presents a more detailed consideration of this relationship between OFSTED and value added.

Table 2 Descriptive statistics by provider performance group (Thin Level 2 and Below Level 2)

	Providers which performed substantially worse than expected	Providers which performed as well as expected	Providers which performed substantially better than expected
Percentage 25+ years old	72.5	69.0	64.9
Percentage white learners	72.9	74.1	67.9
Percentage full-time learners	14.1	16.5	16.5
Log(Provider size)	11.2	11.4	11.4
Average IMD score	24.2	24.9	**28.6***
Unemployment Rate (Local Authority level)	10.6	11.2	12.6
Percentage BL2 learners	**40.2***	32.0	38.3
Percentage L2 learners	18.1	16.3	13.5
Percentage located in London or in the South	60.0	37.3	40.0
Percentage of disabled students	6.4	5.5	7.0
Percentage of low returns courses	78.3	76.7	**81.7***
Percentage of high returns courses	2.2	3.3	2.9
Ofsted score	2.1	2.1	1.9
N	15	75	10

We used a t-test to check if the average differences of the main covariates between the providers which performed substantially worse or better than expected and those which performed as expected are statistically significant.
*** significant at the 1% level; ** 5%; * 10%

Even when considering the differences flagged in the discussions around Table 2 and Table 3, numbers in the low and high-ranked categories are themselves rather low. In Table 2, a 7 percentage point difference would result from a change in the characteristics of only one Provider amongst the lowest-ranked group – in this context, even some of the more pronounced differences detailed to now seem less substantial and this is why few are statistically significant. Also, it is often the highest and lowest performing that seem to share similar characteristics, compared to the middle-ranked (when considering the proportion of White learners; the percentage of BL2 learners; the percentage of disabled students; and the percentage of low returns courses). This may be one reason for the identification of fewer significant variables in the Provider-level regression analysis than might be expected – as it suggests something of a non-linear relationship. However, as

suggested in the Conclusion, we are also missing many key Provider-level variables that would ideally be included in the regression analysis.

Table 3 Descriptive statistics by provider performance group (Full Level 2, Level 3 and Full Level 3)

	Providers which performed substantially worse than expected	Providers which performed as well as it was expected	Providers which performed substantially better than expected
Percentage 25+ years old	54.8	49.8	48.7
Percentage white learners	77.5	83.6	**74.1****
Percentage full-time learners	38.5	39.6	43.7
Log(Provider size)	11.2	11.3	11.1
Average IMD score	**29.5*****	23.9	25.0
Unemployment Rate (Local Authority level)	**13.4*****	11.1	10.8
Percentage FL2 learners	34.0	31.3	25.7
Percentage L3 learners	8.7	9.7	10.6
Percentage FL3 learners	**19.8***	25.2	26.9
Percentage located in London or in the South	33.3	37.1	**68.8****
Percentage of disabled students	3.9	3.6	4.2
Percentage of low returns courses	42.1	42.5	42.6
Percentage of high returns courses	23.4	24.2	28.6
Ofsted score	54.8	49.8	48.7
N	18	105	16

We used a t-test to check if the average differences of the main covariates between the providers which performed substantially worse or better than expected and those which performed as expected are statistically significant.

*** significant at the 1% level; ** 5%; * 10%

Table 3 details the differences in characteristics between the three Provider groups, categorised according to their average Full Level 2 and above earnings-return value-added. Here we again find relatively few statistically significant differences between the

categories of Provider; but there is still some remaining negative correlation between Provider performance and the proportion aged 25+; the proportion located in London and the South is greater amongst the highest- (69%), compared to the middle-, ranked (37%); the proportion of White learners is significantly lower amongst the top-ranked; the average IMD score remains significantly higher in the lowest-ranked Providers and this is also true of the local unemployment rate; and a higher percentage of full-time learners is observed amongst the better-performing Providers. The percentage of high-returns courses amongst high value added Providers (28.6%) remains higher than the lowest performing Providers (23.4%). The correlation between OFSTED score and ranking is in the direction that we might expect, with a better OFSTED performance associated with the better-performing Providers (but again this is not statistically significant).

Before moving on it is worth noting the tendency for highest and lowest-ranked Providers to be located in the most disadvantaged areas. More specifically, in Table 2 the highest performing Providers have the highest average IMD scores; whilst in Table 3 the lowest performing Providers have the highest average IMD scores (with the highest ranking Providers still having a higher average IMD score than the middle-ranked). More work is needed in this area, but it seems consistent with findings from other work[20] that identifies higher returns to many FE qualifications for learners from disadvantaged backgrounds (showing that, if a Provider gets it right in these areas, returns can be high); but also, findings that learners from disadvantaged backgrounds tend to be less-well-informed about educational choices (and therefore poorer-performing Providers in these areas have a potentially less discerning client group). It hints at the potential for greater Provider variability in the poorest areas of England, but more work is needed.

4.2 Correlations across Value Added measures and with OFSTED score

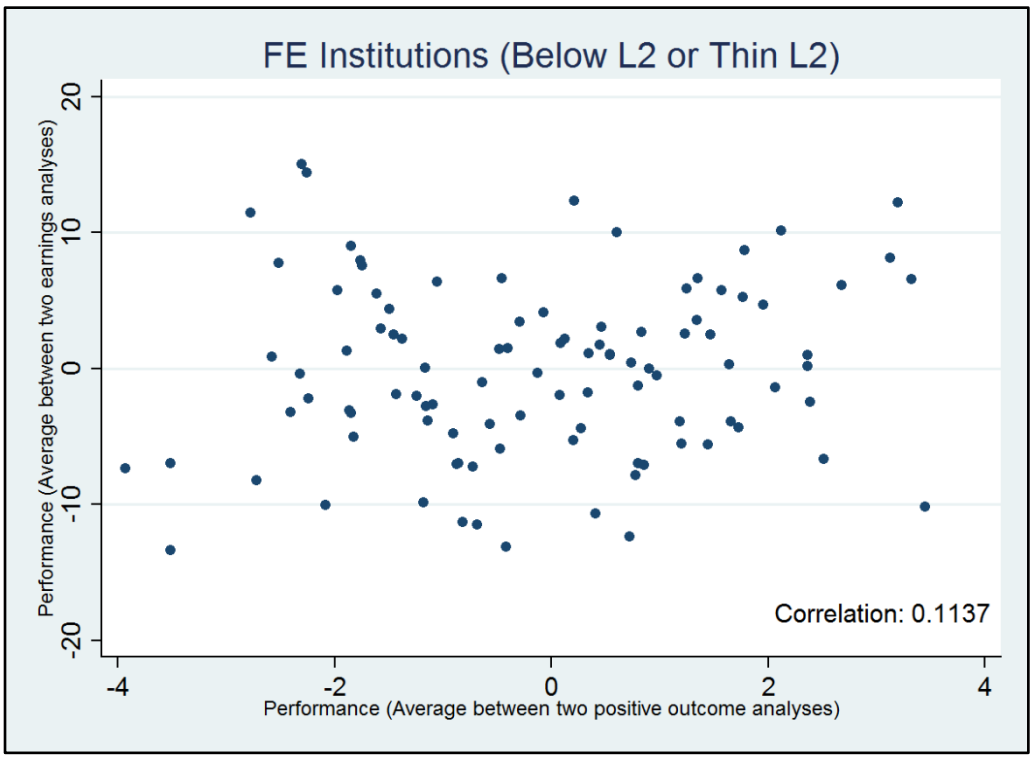
As suggested in the introduction, this is very much an exploratory analysis, with a key aim being to determine the extent to which ILR-WPLS administrative data can be used to capture FE Provider value added. We have already presented an analysis of the Correlations between Outcome and Pass Rate across Providers at the end of Section 3.1. The suggestion is that there is little correlation between these two indicators, and we take this as providing some support for the use of an achiever V non-achiever approach to estimation of Provider value added. Figure 15 now considers correlation between the indicators used in this section to determine whether a Provider features in the group of top-, middle-, or bottom-ranked Providers. Specifically, we consider the correlation between (i) earnings value added, as predicted by the average of the ‘between’ and

[20] Bibby, D., Cerqua, A., Gould, M., Thomson, D. and Urwin, P. (2016), “Further Education: Skills, Second Chances and Pathways to Social Mobility”, mimeo.

'within' Provider-level analyses; and (ii) a positive-outcome estimate, averaged across the between and within Provider analyses.

Figure 15 suggests that there is a positive correlation between the two indicators [when considering Thin L2 and BL2], but this is only 11.37%. This suggests that, generally, Providers that perform well in terms of earnings value-added are also more likely to secure higher HE progression and employment rates for their learners, but that the correlation is weak. This is perhaps to be expected, as there may be a negative relationship between earnings and employment/HE returns within certain sectors. For instance, in Bibby et. al. (2014) we identify some of the highest earnings returns to engineering at FL2 and FL3; whilst employment returns are negligible – some of this may be explained by progression to HE, but there are many other possible factors at work. Any Provider that focuses on sectors such as engineering might reasonably display high earnings and low employment value added.

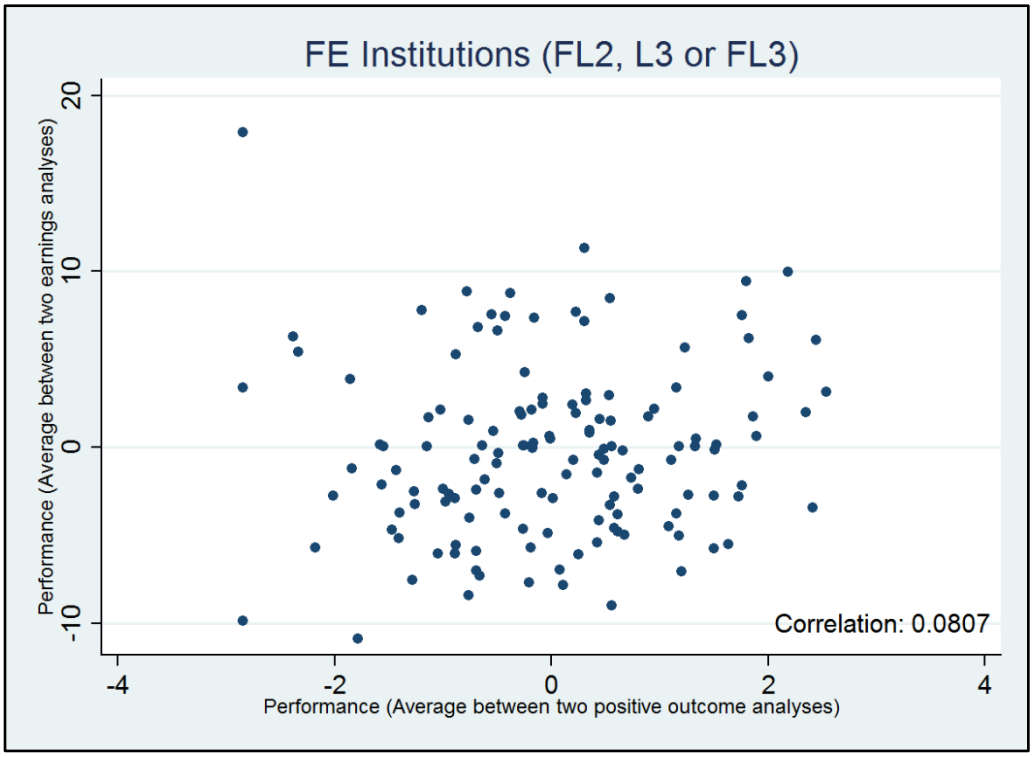
Figure 15 Scatter plot of (i) the average earnings performance in second year across Providers and (ii) the average positive outcome performance in second year across Providers; for all achieved 'Thin Level 2' or 'Below Level 2' ILR highest learning aims



The correlation between earnings value added and our positive-outcome estimate is even lower in Figure 16, at only 8.1%, when we consider the FL2+ categories of highest learning aim. Again there are a number of possible reasons for this, but in both Figure 15 and Figure 16 it is important to note that our analysis is mainly focused on those Providers in the bottom left quadrant (who make up our category of Providers which performed substantially worse than expected) and those in the top right (the Providers which performed substantially better than expected). As we suggest in the conclusion,

such Providers could reasonably argue that our list of variables at a Provider-level miss many of the factors that explain variation in estimated Provider value added.

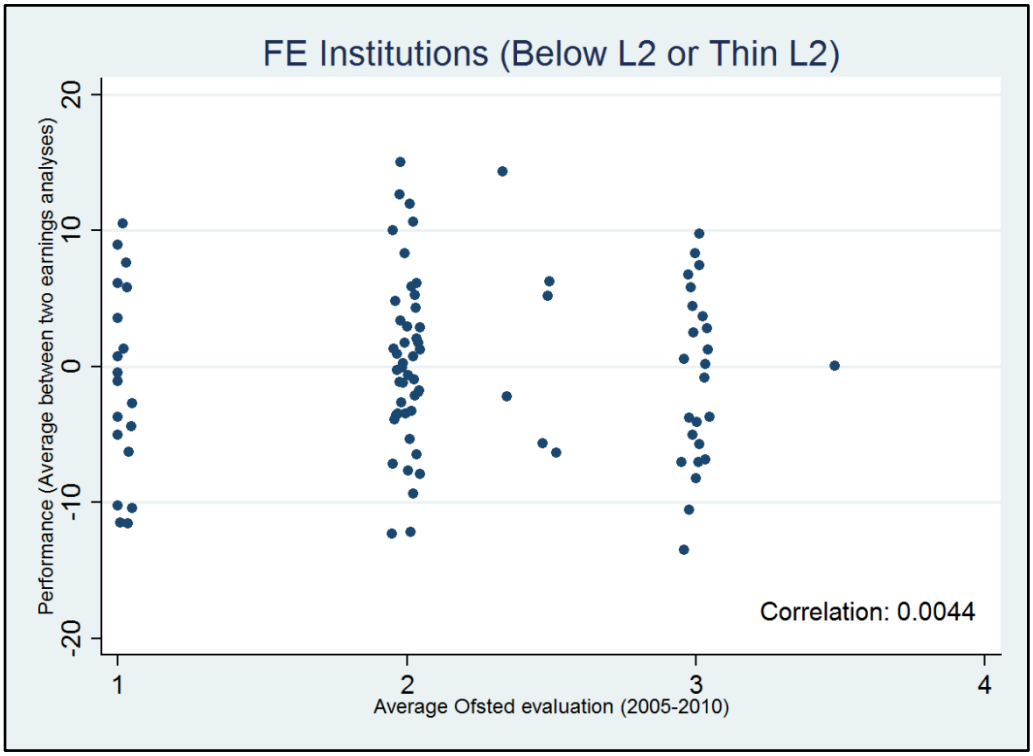
Figure 16 Scatter plot of (i) the average earnings performance in second year across Providers and (ii) the average positive outcome performance in second year across Providers; for all achieved 'Full Level 2', 'Level 3' or 'Full Level 3' ILR Highest learning aims



As part of this project we have also matched in OFSTED scores between 2005 and 2010. One might expect this to provide us with additional information at the Provider-level, with OFSTED score possibly acting as a proxy for some of the teacher/leadership quality and resource/finance indicators missing from our analysis. As the discussion around Tables 2 and 3 suggests, there is apparently little correlation between OFSTED score and value added at the Provider level – Figures 17 and 18 confirm this initial conclusion.

Figure 17 is a scatter plot, detailing the correlation between our measure of (i) earnings value added, as predicted by the average of the 'between' and 'within' Provider-level analyses and (ii) the average OFSTED score for the Provider between 2005 and 2010. As in the previous analysis, the highest OFSTED score is recorded as '1' and therefore the [small] positive correlation is in the opposite direction to that which we would expect, if OFSTED score is in any way 'predictive' of value added measures. At the higher levels of FL2+ learning considered in Figure 18 there is a negative correlation, suggesting that a more favourable OFSTED score (of 1 or 2, compared to 3 or 4) is correlated with higher Provider Value Added – but the relationship is insignificant.

Figure 17 Scatter plot of (i) the average earnings performance in second year across Providers and (ii) the average Ofsted evaluation during the period 2005-2010; for all achieved 'Thin Level 2' or 'Below Level 2' ILR Highest learning aims

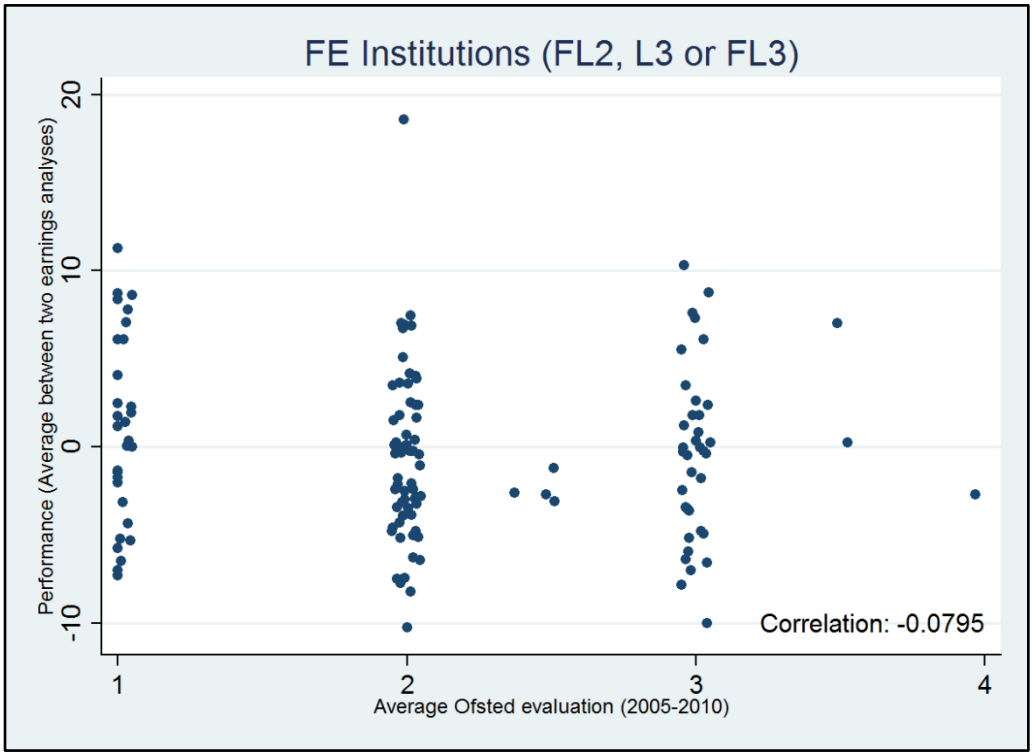


Note: Data have been jittered to favour the visibility of each point

We have only presented the correlations between earnings value added estimates and OFSTED score; as the same conclusion holds for employment value added and our positive indicator, when graphed in a scatter plot with OFSTED score. It is worth noting that whilst the approach of Griffiths, Rothstein and Wolf (2015) to consideration of quality in Higher Education differs from our own[21], it also concludes that quality indicators (awarded by the Quality Assurance Agency) are not correlated with a range of observable indicators at the HE Provider-level.

[21] In that they use observable HE Provider-level indicators to predict quality scores (awarded by the QAA), rather than using the scores to predict student outcomes.

Figure 18 Scatter plot of (i) the average earnings performance in second year across Providers and (ii) the average Ofsted evaluation during the period 2005-2010; for all achieved 'Full Level 2', 'Level 3' or 'Full Level 3' ILR Highest learning aims



Note: Data have been jittered to favour the visibility of each point

5. Conclusion

This report presents the results of a project to investigate how the labour market outcomes secured by individual learners vary across FE Providers; using an achiever V non-achiever/drop-out approach to estimation, similar to that used in previous BIS-commissioned studies that utilise ILR-WPLS administrative data. In the analysis we calculate a measure of value added for each FE Provider by,

1. Estimating a separate [Achiever V Non-achiever/drop-out] regression for all individuals with the relevant highest learning aim within a particular Provider.
2. Each one of these regression equations provides us with an average estimate of Provider value added, in terms of (i) earnings, (ii) employment and (iii) HE premiums, measured two years from the end of learning.
3. We then present the variation in these value added measures, across all Providers that meet a minimum size requirement.

The results of this analysis suggest substantial variation in value added across FE Providers, whether considering *Earnings Return* estimates, *Employment Premiums* or *Higher Education Progress Premiums*.

We then use each of these value added rankings in a Provider-level regression analysis, that has the value added estimates as dependent variables (Y) and a variety of Provider-level characteristics as explanatory variables (X). This allows us to discuss those Provider-level characteristics (if any) that are most important in explaining the observed variation in Provider-level value added, for this broad group of FE Providers. The results suggest that our split of learning into Full Level 2+ (FL2+) and Thin Level 2 and Below is justified, as we see very different factors explaining variation in value added – and in some cases, the same characteristic works in opposite directions.

However, even when we have accommodated a variety of Provider-level characteristics, substantial variation in value added across FE Providers remains; again whether we consider *Earnings Return* estimates, *Employment Premiums* or *Higher Education Progress Premiums*. We therefore consider the characteristics of top, middle and low-ranked Large Providers (according to the estimated gap between their expected and actual value added) – with one set of analysis concentrating on the Thin Level 2 and Below category of highest learning aims and one for the Full Level 2+ category. This serves as a check of outcomes from the Provider-level analysis – if the regression equation has been effective in accommodating observable differences, the three groups should look similar – and it also provides additional insights into our findings. If we find few remaining differences in characteristics between Providers, the suggestion is that differences in value added are more likely due to unobservable factors related to Provider efficacy.

The group of top-ranked Providers have (i) earnings premiums that are more than one standard deviation above their expected level, as predicted by the average of the 'between' and 'within' Provider-level econometric analyses undertaken as part of the study; and (ii) an average positive-outcome that is estimated to be positive [across the between and within Provider analyses]. The bottom-ranked Providers have (i) an earnings value added [averaged across the two analyses] that is more than one standard deviation below the level expected and (ii) an average of the two positive outcomes estimates that is negative. The middle-ranked are within one standard deviation of that which is expected, and/or take on conflicting values of earnings and positive outcomes estimates across the two sets of analyses.

When considering L2 or Below, there is still some remaining correlation between Provider performance and the proportion aged 25+ (with a higher percentage aged 25+ still associated with lower value added). However, the differences are not statistically significant. In contrast, the higher-ranked Providers have an average IMD score (28.6) that is (statistically) significantly higher, when compared to both the middle (24.9), and lower (24.2) ranked Providers. Similarly, a higher local unemployment rate is still more likely to be observed for higher-ranked Providers, but this is not significant. When considering Full Level 2 and above earnings-return value-added, the average IMD score remains significantly higher in the lowest-ranked Providers and this is also true of the local unemployment rate.

There seems some tendency for the highest and lowest-ranked Providers to be located in more disadvantaged areas. More work is needed in this area, but it seems consistent with findings from other work that identifies higher returns to many FE qualifications for learners from disadvantaged backgrounds (showing that, if a Provider gets it right in these areas, returns can be high); but also, findings that learners from disadvantaged backgrounds tend to be less-well-informed about educational choices (and therefore poorer-performing Providers in these areas have a potentially less discerning client group). Our analysis hints at the potential for greater Provider variability in the poorest areas of England, but more work is needed.

As part of this project we have also matched in OFSTED scores between 2005 and 2010. One might expect this to provide us with additional information at the Provider-level, with OFSTED score possibly acting as a proxy for some of the teacher/leadership quality and resource/finance indicators missing from our analysis. However, there is little apparent correlation between OFSTED score and value added at the Provider level (whether we consider earnings value added, employment or HE progression). It is worth noting that whilst the approach of Griffiths, Rothstein and Wolf (2015) to consideration of quality in Higher Education differs from our own, it also concludes that quality indicators (awarded by the Quality Assurance Agency) are not correlated with a range of observable indicators at the HE Provider-level.

What are we to take from this analysis?

Across all of our analyses, any difference between, and within, Providers that we cannot explain is necessarily estimated with error – something that must be taken into account in all statistical studies. If we observe a difference in the value added between Provider 1 and Provider 2 from the achiever V non-achiever analysis, it is not necessarily the case that all the difference is due to a gap in value added. As a result, all the findings here should be considered with caution.

If a Provider's performance is ranked lower in both sets of analysis (both from the 'within' and 'between' estimations) then one may see this as some form of 'triangulation' of the findings. However for both sets of estimates, a key issue for future development, is the inclusion of more Provider-level characteristics (particularly those related to teacher quality, resource, funding general resource, class size etc.). In some of our Provider-level regression equations there are very few significant variables. This could reflect the fact that generally Provider-level indicators are not important in explaining differences in value added; but it is more likely the case that we are simply not capturing some of the key factors that explain differences in performance. It is quite possible that Providers ranking lower using both approaches to analysis, are doing so in both instances because of the factors we are not able to include in our analysis.

Thus, whilst there are a number of strengths and weaknesses to the econometric approach adopted, one must be very careful in interpretation of results relating to specific Providers. However, with this caveat in mind, whether we consider raw differences in labour market outcomes; [two sets of] value added estimates prior to consideration of Provider-level characteristics; an analysis that also takes account of Provider-level characteristics; or splits of the population that differentiate larger and smaller Providers, there is evidence of extensive Provider-level variation in labour market returns, which cannot easily be explained.

There are a number of issues to consider going forward with this work:

- Some findings are perhaps surprising. For instance, we find that Providers with higher proportions of 'White' students are sometimes associated with lower returns. One usually sees ethnicity having negative impacts, because of discrimination and other forms of disadvantaged experienced by individuals from non-white backgrounds[22] in the UK labour market. However, the selection effects into FE are so strong that, relative to the disadvantaged nature of FE learners, we find that being from an ethnic minority background has a positive impact on outcomes. This fits with our findings elsewhere – for instance, we find that

[22] Clearly a 'White' / 'Non-white' distinction is far from ideal, but we have no chance to make finer distinctions of ethnic background, given the numbers in our Provider-level analysis.

amongst some particularly disadvantaged groups of FE learners (as reflected in IMD score), there are high levels of HE progression – driven by the large proportion of learners from an ethnic minority background.

- The segmentation we have used for analysis is very much a first attempt (though it does seem to have some justification from the Provider-level regression results), and there will be opportunities to carry out analyses separately for key categories of Provider (for instance, taking into account the eport from Frontier Economics[23]).
- Any future analysis needs to consider the extent to which, within each Provider, there is extensive variation around average value-added, as it may be the case that variability in performance is more pronounced across the campuses of larger Providers (i.e. we may have substantial within-Provider variation), in addition to that between Providers.
- The Data and Method section flags the potential for some of our indicators that capture Balance of Provision, to be endogenous. This seems less of a problem than we might have thought, as few of these indicators are significant in the Provider-level analysis. However, these issues and others of method need to be considered further in any future analysis.

This analysis is very exploratory in nature and a key aim is to identify (i) the extent to which we observe variation in average labour market outcomes across FE Providers; (ii) the extent to which this analysis delivers robust indicators that could be used to investigate 'quality' or 'efficacy' across FE Providers; and (iii) what we might consider as next steps in the research. As we suggest above, there is a case to be answered here, as we do observe significant variability in FE Provider value added; but more work is needed before we have an analysis that can be considered as robust. DfE may usefully follow up on this analysis, with a specific qualitative/case study investigation of some larger Providers at the extremes of our value added ratings.

We would not wish the current analysis to be used to identify specific under-, or over-performing Providers. However, when considering raw differences in labour market outcomes, we see significant variation across Providers. Having estimated labour market value-added, and controlling for additional Provider level characteristics, there remains considerable unexplained variation in returns. This warrants further investigation.

[23] Snelson, S. and Deyes, K. (2016), "Understanding the Further Education Market in England", Department for Business, Innovation and Skills, Research Paper No. 296

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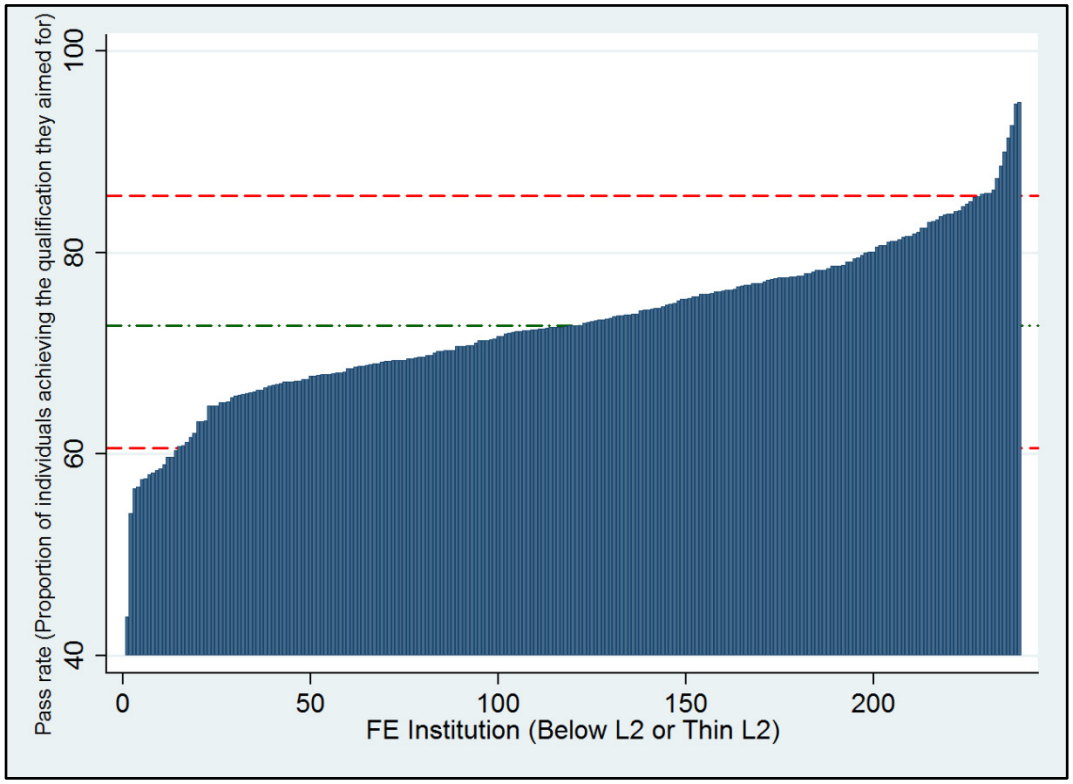
Technical Appendix

Figure 19 presents the variation in Pass Rates across Providers, for all highest learning aims recorded as either 'Thin Level 2' or 'Below Level 2'; selecting only those Providers that have at least 1,500 individuals with a highest learning aim of either 'Thin Level 2' or 'Below Level 2', or 1,500 in both [24].

Figure 19 Variation in overall achievement (pass) rates across ILR Providers[1], for all 'Thin Level 2' or 'Below Level 2' ILR highest learning aims

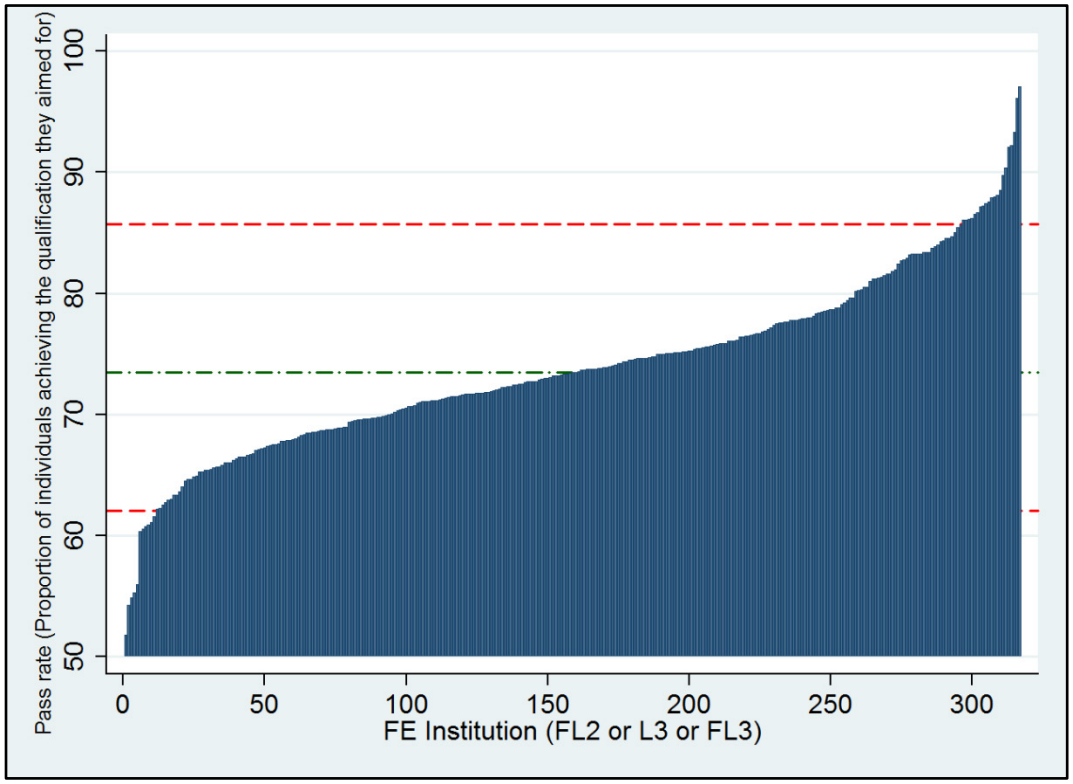


1 Providers with at least 1,500 highest learning aims in total and with (ii) some of these highest learning aims recorded prior to 2008

Figure 20 presents pass rates for all highest learning aims recorded as 'Full Level 2' or 'Level 3' or 'Full Level 3'; again selecting only Providers that have at least 1,500 individuals within each of these highest learning aims, some of which appear before 2008. The rankings in Figures 24 and 25 are not markedly different, and the slight fall-off in the gradient of pass rates occurs at a similar point in both rankings – when we are considering around 100 institutions with the lowest pass rates.

[24] We have a total of 13.2m learning aims which end by 2013, and which have a valid UKPRN that allows us to identify FE Providers associated with Learning Aims. In these Figures, our 'pass rate' corresponds closely to the achiever V non-achiever split used in existing ILR-WPLS studies – the only difference being that the denominator also contains a small number who do not achieve their highest learning aim, but do achieve an intermediate learning aim.

Figure 20 Variation in overall achievement (pass) rates across ILR Providers[1], for all 'Full Level 2', 'Level 3' or 'Full Level 3' ILR highest learning aims



1 Providers with (i) at least 1,000 highest learning aims and with (ii) some of these highest learning aims recorded prior to 2008

Table 4 Provider-level OLS analysis of factors associated with Thin Level 2/Below Level 2, percentage point employment premium [Value added] for each Provider

	All providers with at least 1,500 learners in low level qualifications	All providers with at least 1,500 learners in low level qualifications (still open in 2013)	All providers with at least 5,000 learners in low level qualifications (still open in 2013)
Proportion 25+ years old	1.2339	2.4397	2.8939
Proportion white learners	0.3866	0.7205	2.7214*
Proportion full-time learners	3.2970***	3.7421***	3.7156**
Log(Provider size)	-0.0681	0.0536	-0.0900
IMD score	-0.0405	-0.0151	0.0238
Unemployment rate	0.1238	0.0798	-0.0169
Region (baseline: North)			
South	-0.1823	-0.2238	-0.3635
Midlands	-0.6109	-0.3627	0.0336
East Anglia	-0.1399	-0.0291	-0.2114
London	0.0298	-0.0732	0.3895
Yorkshire and the Humber	0.0380	0.0354	0.1070
Proportion BL2 learners	-0.1312	-0.2320	1.9090
Proportion L2 learners	1.9807	0.4794	-9.1602***
Number of sites	0.0216*	0.0137	0.0115
Proportion of low returns courses	-0.7043	-1.2747	4.5871**
Proportion of high returns courses	-3.8643**	-3.1936*	0.0046
Constant	-0.2162	-2.2899	-3.7825
N	239	213	100
R^2	0.1370	0.1204	0.2275
Adjusted R^2	0.0748	0.0486	0.0786

*** significant at the 0.1% level; ** 1% and * 5%

Table 5 Provider-level OLS analysis of factors associated with Full Level 2/Level 3/Full Level 3, percentage point employment premium [Value added] for each Provider

	All providers with at least 1,500 learners in high level qualifications	All providers with at least 1,500 learners in high level qualifications (still open in 2013)	All providers with at least 5,000 learners in high level qualifications (still open in 2013)
Proportion 25+ years old	-2.5264	-5.0018*	-4.1605*
Proportion white learners	-0.5393	-1.7162	2.0225
Proportion full-time learners	-0.5664	-2.8572	-2.3478
Log(Provider size)	0.1121	0.1672	0.4645
IMD score	0.0775	0.0937	-0.0618
Unemployment rate	-0.0802	-0.1133	0.1855
Region (baseline: North)			
South	0.5233	0.2177	0.2704
Midlands	-0.8294	-0.9506	0.0235
East Anglia	-1.4568	-1.8510	-0.0225
London	0.1296	-0.7537	2.5184**
Yorkshire and the Humber	-0.3086	-1.0049	-0.2123
Proportion FL2 learners	-1.4236	-2.2323	1.4830
Proportion L3 learners	0.1741	0.8788	6.6610
Proportion FL3 learners	1.0718	0.3604	0.9011
Number of sites	0.0179	0.0128	0.0025
Proportion of low returns courses	-6.1732*	-5.2155	-1.6625
Proportion of high returns courses	-0.4829	0.8094	6.5289***
Constant	2.7078	5.3712	-6.9641
N	316	280	139
R^2	0.0547	0.0695	0.2896
Adjusted R^2	0.0008	0.0091	0.1898

*** significant at the 0.1% level; ** 1% and * 5%

Table 6 Provider-level OLS analysis of factors associated with Full Level 2/Level 3/Full Level 3, percentage point HE premium [Value added] for each Provider

	All providers with at least 1,500 learners in high level qualifications	All providers with at least 1,500 learners in high level qualifications (still open in 2013)	All providers with at least 5,000 learners in high level qualifications (still open in 2013)
Proportion 25+ years old	-1.9644	-1.8762	-2.1222
Proportion white learners	3.4679	3.1995	-1.6586
Proportion full-time learners	2.2590	2.3087	5.8338***
Log(Provider size)	0.7544*	0.7470*	0.3607
IMD score	0.3910*	0.4842**	0.0079
Unemployment rate	-0.5825	-0.7715	0.0427
Region (baseline: North)			
South	3.8063***	3.7775***	0.6304
Midlands	0.8585	0.7149	0.8258
East Anglia	1.6106	1.5117	0.9984
London	1.5483	0.6959	0.4900
Yorkshire and the Humber	2.0336	2.7621	1.1113*
Proportion FL2 learners	-0.3449	-0.4211	2.1258
Proportion L3 learners	11.6531**	15.0179***	5.9485
Proportion FL3 learners	-1.3371	-1.4636	5.5733***
Number of sites	-0.0020	-0.0035	-0.0135
Proportion of low returns courses	-2.4880**	-3.3491*	-2.4648
Proportion of high returns courses	-2.0086	-2.0796	3.9613
Constant	-11.8319	-11.6169	-3.8490
N	316	280	139
R^2	0.1295	0.1402	0.6026
Adjusted R^2	0.0798	0.0844	0.5468

*** significant at the 0.1% level; ** 1% and * 5%

Table 7 Provider-level OLS analysis of factors associated with Full Level 2/Level 3/Full Level 3, percentage point 'Positive Outcome' premium [Value added] for each Provider

	All providers with at least 1,500 learners in high level qualifications	All providers with at least 1,500 learners in high level qualifications (still open in 2013)	All providers with at least 5,000 learners in high level qualifications (still open in 2013)
Proportion 25+ years old	-3.3784	-6.5745**	-5.5378**
Proportion white learners	-6.4363	-7.8337	-0.3978
Proportion full-time learners	0.7817	-2.2585	-0.1880
Log(Provider size)	0.2630	0.3829	0.4159
IMD score	0.1363	0.2022	-0.1053
Unemployment rate	-0.1527	-0.2958	0.3144
Region (baseline: North)			
South	0.4355	-0.1213	-0.0379
Midlands	-0.8108	-1.0089	0.3856
East Anglia	-0.4101	-0.8488	-0.2072
London	-1.9017	-3.2701	2.3703*
Yorkshire and the Humber	-0.6557	-1.3885	-0.0686
Proportion FL2 learners	0.0804	-0.6425	2.9149**
Proportion L3 learners	5.1082	6.9015	4.2877
Proportion FL3 learners	2.2104	1.4910	2.8665
Number of sites	0.0135	0.0060	-0.0093
Proportion of low returns courses	0.1623	-2.1965	-1.7215
Proportion of high returns courses	3.4454	5.2859	11.6781***
Constant	3.9326	7.2970	-4.4546
N	316	280	139
R^2	0.1451	0.1717	0.5306
Adjusted R^2	0.0963	0.1180	0.4647

*** significant at the 0.1% level; ** 1% and * 5%

Table 8 Provider-level OLS analysis of factors associated with Thin Level 2/Below Level 2, percentage earnings premium [Value added] for each Provider

	All providers with at least 1,500 learners in low level qualifications	All providers with at least 1,500 learners in low level qualifications (still open in 2013)	All providers with at least 5,000 learners in low level qualifications (still open in 2013)
Proportion 25+ years old	-8.4009	-11.8921*	-4.3965
Proportion white learners	-8.4355	-10.8593	-17.7935**
Proportion full-time learners	-8.9063*	-9.7280*	1.9446
Log(Provider size)	-1.2822	-1.0483	-4.0126*
IMD score	-0.0272	-0.0355	-0.3986
Unemployment rate	0.2354	0.2917	1.0168
Region (baseline: North)			
South	-2.7699	-2.6700	1.2190
Midlands	-2.5691	-2.9840	-1.9804
East Anglia	-2.0004	-3.2070	3.0751
London	-0.6312	-1.7016	2.6176
Yorkshire and the Humber	-2.4444	-2.7772	2.6201
Proportion BL2 learners	-1.9964	1.1863	0.9158
Proportion L2 learners	-2.8512	-2.8030	3.6368
Number of sites	0.0530	0.0775*	0.1579**
Proportion of low returns courses	-4.7823	-4.9534	-23.6146
Proportion of high returns courses	35.9504***	35.9361***	-10.0865
Constant	34.3040**	34.8655**	77.6138***
N	239	213	100
R^2	0.1176	0.1487	0.2891
Adjusted R^2	0.0540	0.0792	0.1521

*** significant at the 0.1% level; ** 1% and * 5%

Table 9 Provider-level OLS analysis of factors associated with Full Level 2/Level 3/Full Level 3, percentage earnings premium [Value added] for each Provider

	All providers with at least 1,500 learners in high level qualifications	All providers with at least 1,500 learners in high level qualifications (still open in 2013)	All providers with at least 5,000 learners in high level qualifications (still open in 2013)
Proportion 25+ years old	-8.9297	-14.1708	-17.3189
Proportion white learners	19.5607	18.8996	-16.0900*
Proportion full-time learners	-14.8783**	-17.1405**	-8.0672
Log(Provider size)	1.6451	1.8112	1.3810
IMD score	-0.0469	-0.0287	-0.8298**
Unemployment rate	-0.0158	-0.0426	1.6555**
Region (baseline: North)			
South	-1.1796	-1.7813	-1.2820
Midlands	-2.6521	-2.5766	0.5999
East Anglia	-3.9953	-4.6158	-4.7179*
London	8.9129	7.7886	-1.9921
Yorkshire and the Humber	-0.8823	-2.6324	0.9964
Proportion FL2 learners	2.6678	0.7438	2.5460
Proportion L3 learners	-4.9666	-3.3110	-54.2306***
Proportion FL3 learners	4.0990	2.2195	2.4647
Number of sites	-0.0934*	-0.0796	-0.0279
Proportion of low returns courses	-11.3910	-15.1817	4.5519
Proportion of high returns courses	2.8375	-3.3705	20.0605**
Constant	-10.1902	-3.7665	17.8824
N	316	280	139
R^2	0.1474	0.1391	0.3308
Adjusted R^2	0.0988	0.0832	0.2368

*** significant at the 0.1% level; ** 1% and * 5%

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